YAMAHA

OWNER'S MANUAL

RS Vector

RS90RX
RS90GTX
RS90GTAX
RS90LTX
RS90LTGTX

LIT-12628-02-70

8GM-28199-10

ESU10040

⚠ WARNING

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

YAMAHA LIT-CALIF-65-01

ESU10120

Congratulations on your purchase of a Yamaha snowmobile. This model is the result of Yamaha's vast experience in the production of fine sporting and touring snowmobiles. It represents the high degree of craftsmanship and reliability that have made Yamaha a leader in these fields.

This manual will give you an understanding of the operation, inspection, and basic maintenance of this snowmobile. If you have any questions concerning the operation or maintenance of your snowmobile, please consult a Yamaha dealer.

To maintain the high quality and performance of this snowmobile, it is important that you and your Yamaha dealer pay close attention to the recommended maintenance schedules and operating instructions contained within this manual.

RS90RX
RS90GTX
RS90GTAX
RS90LTX
RS90LTGTX
OWNER'S MANUAL
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Printed in Japan.
P/N LIT-12628-02-70

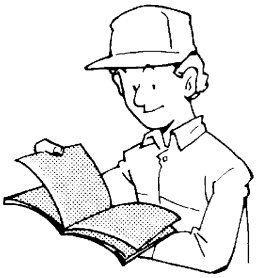
Important manual information

ESU10150

EWS00010

⚠ WARNING

PLEASE READ AND UNDERSTAND THIS MANUAL COMPLETELY BEFORE OPERATING THE SNOWMOBILE.



NOTE:

- Yamaha continually seeks advancements in product design and quality. Therefore, while this manual contains the most current product information available at the time of printing, there may be minor discrepancies between your snowmobile and this manual. If there is any question concerning this manual, please consult a Yamaha dealer.
- This manual should be considered a permanent part of this snowmobile and should remain with the snowmobile when resold.

Particularly important information is distinguished in this manual by the following notations.

⚠ The Safety Alert Symbol means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

EWS00020

⚠ WARNING

Failure to follow WARNING instructions could result in severe injury or death to the snowmobile operator, a bystander, or a person inspecting or repairing the snowmobile.

ECS00010

CAUTION:

A CAUTION indicates special precautions that must be taken to avoid damage to the snowmobile.

NOTE:

A NOTE provides key information to make procedures easier or clearer.

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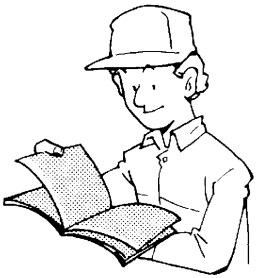
ESU10181

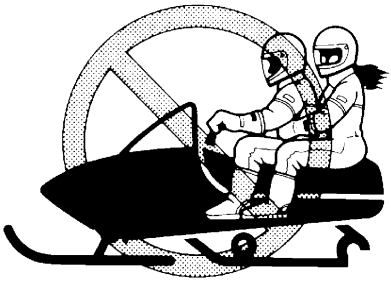
When you ride your snowmobile, you must know and use the following for your safety. Severe injury or death may result if you ignore any of the following.

Before operating

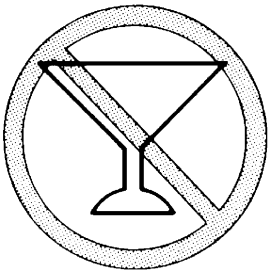
1. Read the Owner's Manual and all labels before operating this snowmobile. Become familiar with all of the operating controls and their function. Consult a Yamaha dealer about any control or function you do not understand.



2. This snowmobile was not manufactured for use on public streets, roads, or highways. Such use is prohibited by law, and you could collide with another vehicle.
3. This snowmobile is designed to carry the OPERATOR ONLY.
   Passengers are prohibited. Carrying a passenger can cause loss of control.

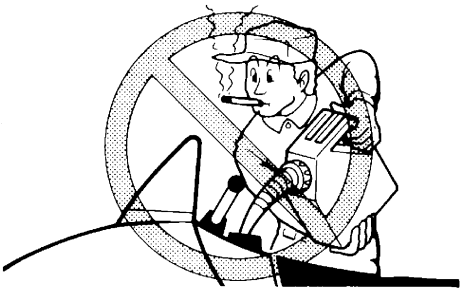


4. Do not operate the snowmobile after drinking alcohol or taking drugs. Your ability to operate the snowmobile is reduced by the influence of alcohol or drugs.



5. For safety and proper care of the snowmobile, always perform the pre-operation checks on page 26 before starting the engine. Check the throttle, brake, and steering for proper operation every time before starting the engine. Make sure that the throttle lever moves freely and it returns to the home position when it is released.
6. Apply the parking brake before starting the engine. Never drive the snowmobile with the parking brake applied. This may overheat the brake disc and reduce braking ability.
7. Do not allow anyone to stand behind the snowmobile when starting, inspecting, or adjusting the snowmobile. A broken track, track fittings, or debris thrown by the track could be dangerous to the operator or bystanders.
8. Handle fuel with care; it is HIGHLY FLAMMABLE.
   - Never add fuel when the engine is running or hot. Allow the engine to cool for several minutes after running.
   - Use an approved fuel container.

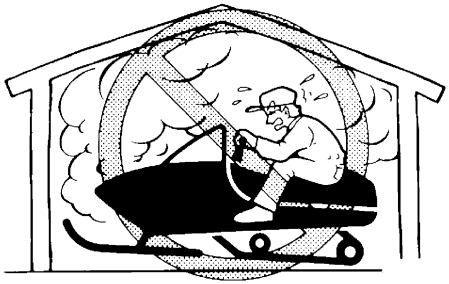
- Fill the fuel tank outdoors with extreme care. Never remove the fuel cap indoors. Never fill the fuel tank indoors.
- Never refuel while smoking or in the vicinity of an open flame.
- Make sure that the fuel tank cap is closed securely after refueling. Wipe up any spilled fuel immediately.



9. If you swallow some gasoline, inhale a lot of gasoline vapor, or get some gasoline into your eyes, see your doctor immediately. If any gasoline spills on your skin or clothing, immediately wash your skin with soap and water, and change your clothes.
10. Wear protective clothing. Wear an approved helmet, and a face shield or goggles. Also, wear a good quality snowmobile suit, boots, and a pair of gloves or mittens that will permit use of your thumbs and fingers for operation of the controls.

Operation

1. Do not run the engine indoors, except when starting the engine to transport the snowmobile in or out of the building. Open the outside doors; exhaust fumes are dangerous.



2. Be careful where you ride. There may be obstacles hidden beneath the snow. Stay on established trails to minimize your exposure to hazards. Ride slowly and cautiously when you ride off of established trails. Hitting a rock or stump, or running into wires could cause an accident and injury.
3. This snowmobile is not designed for use on surfaces other than snow or ice. Use on dirt, sand, grass, rocks, or bare pavement may cause loss of control and may damage the snowmobile.
4. Avoid operating on glare ice, or on snow which has a lot of dirt or sand mixed in. Operation under such conditions will damage or result in rapid wear of ski runners, drive track, slide runners, and drive sprockets.
5. Always ride with other snowmobilers when going on a ride. You may need help if you run out of fuel, have an accident, or damage your snowmobile.
6. Many surfaces such as ice and hard-packed snow require much longer stopping distances. Be alert, plan ahead and

begin decelerating early. The best braking method on most surfaces is to release the throttle and apply the brake gently—not suddenly.

Maintenance and storage

1. When laying the snowmobile on its side for maintenance, use a suitable stand to keep it level.
2. Do not leave the snowmobile on its left side for an extended period of time. Fuel may leak out from the fuel breather hose.
3. Modifications made to the snowmobile not approved by Yamaha, or the removal of original equipment may render your snowmobile unsafe for use that may cause severe personal injury. Modifications may also make the snowmobile illegal to use.
4. Never store the snowmobile with fuel in the fuel tank inside a building where ignition sources are present such as hot water and space heaters, an open flame, sparks, clothes dryers, and the like. Allow the engine to cool off before storing the snowmobile in an enclosed space.
5. Always refer to the “STORAGE” section on page 72 if the snowmobile is to be stored for an extended period.
6. Maintain or replace safety and instruction labels, as necessary.

⚠ Safety information

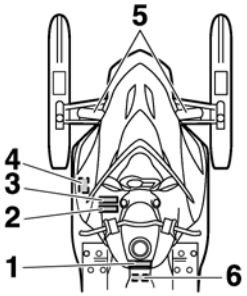
ESU10231

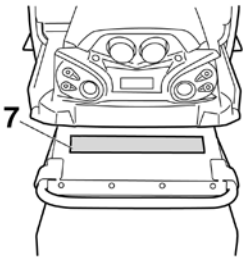
Location of the important labels

Please read the following labels carefully before operating this snowmobile.

NOTE:

Maintain or replace safety and instruction labels, as necessary.





1

⚠ WARNING

SEVERE INJURY OR DEATH MAY RESULT IF YOU IGNORE ANY OF THE FOLLOWING:
- Read the Owner's Manual and all labels before operating this vehicle.
- This vehicle is a high performance machine. It should be operated by an experienced operator.
- Check throttle, brake, and steering for proper operation before starting engine.
- Set parking brake before attempting to start engine. Never run this vehicle with the parking brake applied.
- To stop engine in an emergency, push the engine stop switch down.
- Do not operate engine without drive belt or drive guard.
- Make sure the fuel tank cap is closed securely after refueling.
- Do not operate this vehicle on public roads. You could collide with another vehicle.
- This vehicle is designed for operator only – no passengers.
- Check lever position (Forward or Reverse) before moving.
- Wear an approved helmet, eye protection, and adequate clothing for snowmobiling.

⚠ AVERTISSEMENT

AFIN D'ÉVITER TOUT RISQUE DE BLESSURE SÉRIEUSE OU MÊME MORTELLE, VEUILLEZ SUIVRE LES RECOMMANDATIONS SUIVANTES:
- Avant d'utiliser ce véhicule, lire le manuel du propriétaire et toutes les étiquettes.
- Ce véhicule est une machine à haute performance. Elle doit être conduite par un conducteur expérimenté.
- Avant de démarrer le moteur, vérifier l'opération du frein, de l'accélérateur et de la direction.
- Le frein de sécurité doit être appliqué lors du démarrage. Ne pas rouler avec le frein de sécurité actionné.
- En cas d'urgence, utiliser l'interrupteur d'arrêt du moteur.
- Ne pas laisser tourner le moteur sans la courroie ou sans son garde.
- Sassurer que le bouchon du réservoir soit bien refermé après le remplissage.
- Afin d'éviter tout risque de collision, ne pas rouler sur un chemin public.
- Ce véhicule est conçu pour un conducteur seul – aucun passager.
- Vérifier la position du levier (marche avant ou arrière) avant d'être en marche.
- Toujours porter un casque approuvé et un habillement de motoneigiste. Prévoir une protection pour les yeux

8FR-77761-E0

2

ATTENTION
- Eviter de nettoyer le pare-brise avec une solution alcaline ou acide ainsi qu'avec de l'essence ou un diluant.
- Utiliser un détergent neutre.

3JJ-2835Y-B0

3

CAUTION
- Cleaning with alkaline or acid cleaner, gasoline or solvent will damage windshield.
- Use neutral detergent.

3JJ-2835Y-A0

4

⚠ WARNING

DO NOT OPERATE ENGINE WITHOUT V-BELT OR DRIVE GUARD.

⚠ AVERTISSEMENT

NE PAS FAIRE FONCTIONNER LE MOTEUR SANS COURROIE EN V OU PROTECTEUR D'EMBRAYAGE.

YAMAHA 8BD-77762-00

5 RS90GT/RS90GTA/RS90LTGT 6

⚠ WARNING

This unit contains high pressure nitrogen gas.
Mishandling can cause explosion.
- Read owner's manual for instructions.
- Do not incinerate, puncture or open.

⚠ AVERTISSEMENT

Cette unité contient de l'azote à haute pression.
Une mauvaise manipulation peut entraîner d'explosion.
- Voir le manuel d'utilisateur pour les instructions.
- Ne pas brûler ni perforer ni ouvrir.

4AA-22259-70

5 RS90R/RS90LT

⚠ WARNING

This unit contains high pressure nitrogen gas.
Mishandling can cause explosion.
- Read owner's manual for instructions.
- Do not incinerate, puncture or open.

⚠ AVERTISSEMENT

Cette unité contient de l'azote à haute pression.
Une mauvaise manipulation peut entraîner d'explosion.
- Voir le manuel d'utilisateur pour les instructions.
- Ne pas brûler ni perforer ni ouvrir.

4AA-22259-60

7 RS90LT/RS90LTGT

⚠ WARNING

NO PASSENGERS OR CARGO ON THIS TRACK COVER.
It was not designed to carry weight. It could bend or break under load. Anything placed here could block the view of the brake/tail light which could cause an accident.

⚠ AVERTISSEMENT

AUCUN PASSAGER OU MARCHANDISE SUR LE PROTECTEUR DE CHENILLE.
Ce protecteur n'a pas été conçu pour supporter un poids. Il pourrait s'incurver ou se briser sous la charge.
Tout objet ou personne placé à cet endroit pourrait bloquer la vue des feux d'arrêt/arrière et ainsi causer un accident.

8HA-77762-E0

NOTE:

The following suspension adjustment charts are included with the Owner's Manual.

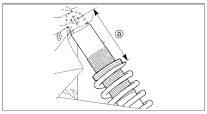
SUSPENSION ADJUSTMENT CHART
TABLEAU DES RÉGLAGES DE LA SUSPENSION

Be sure to have a Yamaha dealer make these adjustments.

Ces réglages doivent être effectués par un concessionnaire Yamaha.

Spring preload adjustments
Réglage de la précontrainte de ressort

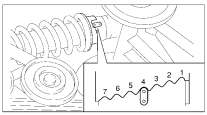
Front spring
Ressort des skis



Spring seat length ⓐ	Increased	Decreased
Preload	Harder ← →	Softer

Longueur de siège du ressort ⓐ	Accrue	Réduite
Précontrainte	Plus dure ← →	Plus souple

Rear spring
Ressort de arrière

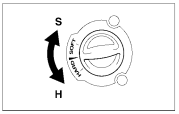


Spring preload adjuster position	1	2	3	4	5	6	7
Preload	Soft ← →						Hard

Position du dispositif de réglage	1	2	3	4	5	6	7
Précontrainte	Souple ← →						Dure

8FU-2818B-00

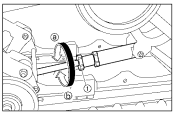
Damping force adjustment
Réglage de la force d'amortissement



Adjustment dial turning direction	S	H
Damping force	Softer ← →	Harder

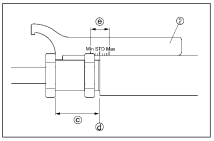
Sens de tournage de la molette de réglage	S	H
Force d'amortissement	Plus souple ← →	Plus dure

Control rod adjustment
Réglage des tiges de réglage



Adjuster ① turning direction	ⓐ	ⓑ
Weight transfer	Increased ← →	Decreased

Sens de tournage de dispositif de réglage ①	ⓐ	ⓑ
Transfert de poids	Accru ← →	Réduit



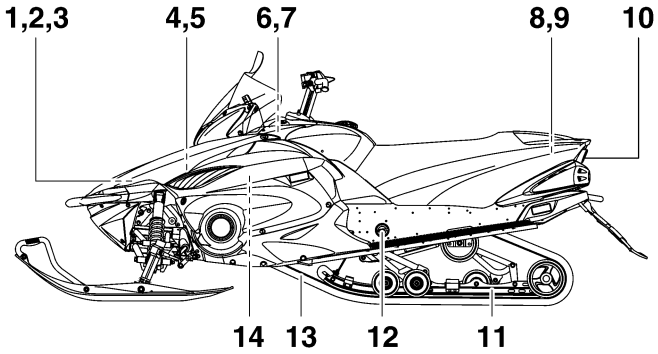
Check the adjuster length ⓒ using the scale on the special wrench ⓕ included in the owner's tool kit as shown.
Make sure that the rim ⓓ of the control rod body is within the range ⓔ of the scale.

Contrôler la longueur du dispositif de réglage ⓒ à l'aide de l'échelle figurant sur la clé spéciale ⓕ fournie dans la trousse de réparation.
Bien veiller à ce que le bord ⓓ de la tige de réglage soit dans la plage ⓔ de l'échelle.

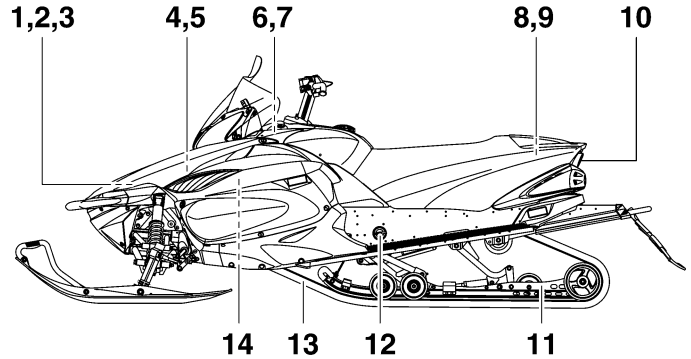
8FU-2818B-00

ESU10260

RS90R/RS90GT/RS90GTA

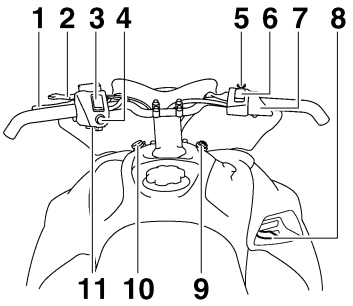


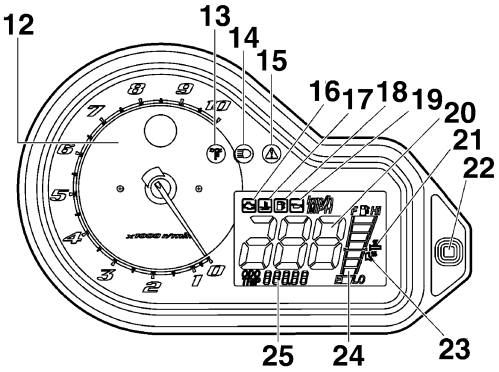
RS90LT/RS90LTGT



1. Battery
2. Main fuse
3. Air filter
4. Oil filler cap
5. Throttle stop screw
6. Fuse box
7. Coolant reservoir
8. Tool kit
9. Storage compartment
10. Tail/brake lights
11. Slide rail suspension
12. Rear suspension damping force remote adjustment dial
13. Drive track
14. V-belt holder

Description





1. Brake lever
2. Parking brake lever
3. Grip warmer adjustment switch
4. Headlight beam switch
5. Engine stop switch
6. Thumb warmer adjustment switch
7. Throttle lever
8. Shift lever
9. Main switch
10. Auxiliary DC jack (RS90GT / RS90GTA / RS90LTGT)
11. Starter (choke) lever
12. Tachometer
13. Low coolant temperature indicator light
14. High beam indicator light
15. Warning light
16. Self-diagnosis warning indicator
17. Coolant temperature warning indicator
18. Fuel level warning indicator
19. Oil level warning indicator
20. Speedometer
21. Grip warmer indicator
22. Select/reset button
23. Thumb warmer indicator
24. Fuel meter and grip/thumb warmer level indicator
25. Odometer/tripmeter

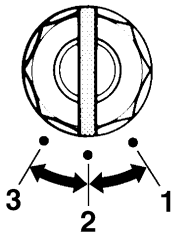
NOTE:

- The snowmobile you have purchased may differ slightly from those shown in the figures of this manual.
- Design and specifications are subjected to change without notice.

ESU10281

Main switch

The main switch controls the ignition and lighting systems. The various positions are described below.



1. Off
2. On
3. Start

Off

The ignition circuit is switched off.

The key can be removed only in this position.

On

The ignition circuit is switched on.

Start

The starting circuit is switched on.

The starter motor cranks the engine.

ECS00020

CAUTION:

Release the switch immediately after the engine starts.

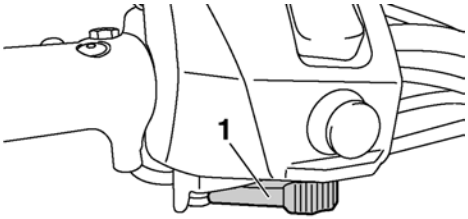
NOTE:

The headlights, meter lighting, and taillights come on after the engine is started.

ESU10300

Starter (choke) lever

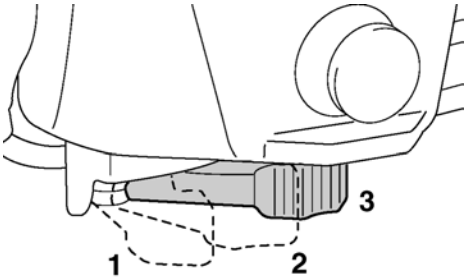
Use the starter (choke) lever when starting and warming up a cold engine.



1. Starter (choke) lever

NOTE:

Refer to the “Starting the engine” section on page 28 for proper operation.

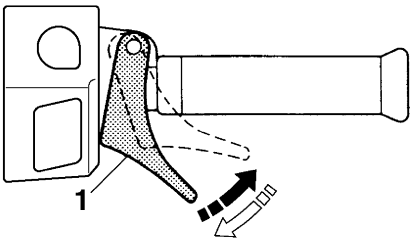


1. Warming up
2. When starting a cold engine.
3. When the engine is warm.

ESU10310

Throttle lever

Once the engine is running cleanly, squeezing the throttle lever will increase the engine speed and cause engagement of the drive system. Regulate the speed of the snowmobile by varying the throttle position. Because the throttle is spring-loaded, the snowmobile will decelerate, and the engine will return to idle when it is released.



1. Throttle lever

EWS00030

⚠ WARNING

Check the throttle, brake, and steering for proper operation before starting the engine. (See page 26.)

ESU10321

Engine overheating prevention system

This model is equipped with a system, which prevents overheating when the engine is idling.

When the engine has been idling for 3 minutes or longer and the coolant temperature has risen above 100 °C (212 °F), the engine automatically stops to prevent overheating.

NOTE:

The engine can be started after it stops.

ESU10331

Throttle override system (T.O.R.S.)

EWS00040

⚠ WARNING

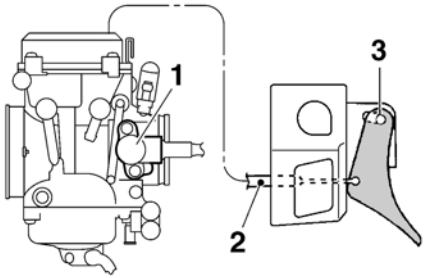
- **If the T.O.R.S. is activated, make sure that the cause of the malfunction has been corrected and that the engine can be operated without a problem before restarting the engine.**
- **Be sure to use the specified spark plug and spark plug cap. Otherwise, the T.O.R.S. will not work properly.**

If the carburetors or throttle cable malfunctions during operation, the T.O.R.S. will operate when the throttle lever is released.

The T.O.R.S. is designed to override the ignition and limit the engine speed to less than the clutch engagement speed if the carburetors fail to return to the idle position when the throttle lever is released. (See page 74 for the clutch engagement speed.)

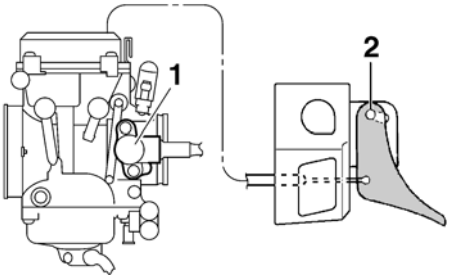
	Idling / starting	Running	Trouble
Throttle switch	Off	On	Off
Throttle position sensor	Closed	Open	Open
Engine	Run	Run	T.O.R.S. will operate.

Idling / starting



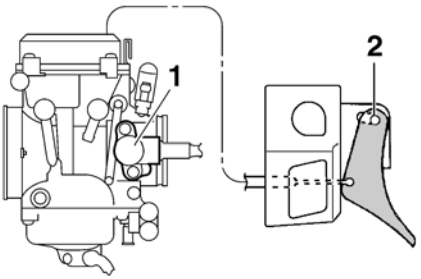
1. Throttle position sensor (throttle valve closed position)
2. Throttle cable
3. Throttle switch (off)

Running



1. Throttle position sensor (throttle valve open position)
2. Throttle switch (on)

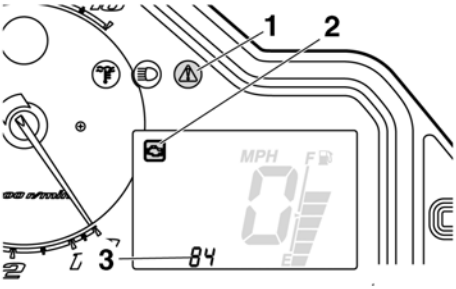
Trouble



1. Throttle position sensor (throttle valve open position)
2. Throttle switch (off)

NOTE:

- When the T.O.R.S. is activated, the warning light and self-diagnosis warning indicator will flash, and the two-digit code “84” will flash in the tripmeter/odometer display.
- The T.O.R.S. monitors the condition of the throttle position sensor, speedometer assembly, and speed sensor, and will operate if any of the monitored items is disconnected or is malfunctioning.



1. Warning light “⚠”
2. Self-diagnosis warning indicator “🔧”
3. Two-digit code “84”

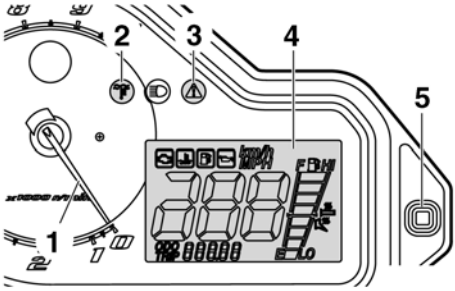
ESU10351

Speedometer unit

The speedometer unit is equipped with the following:

- a digital speedometer (which shows the riding speed)
- an odometer (which shows the total distance traveled)
- a tripmeter (which shows the distance traveled since it was last set to zero)
- warning indicators (which show self-diagnosis, coolant temperature, fuel level, and oil level warnings)
- a fuel meter (which shows the fuel remaining in the fuel tank)
- a grip/thumb warmer level indicator (which shows the grip warmer level or the thumb warmer level)

After the engine is started, the tachometer makes one sweep, and the low coolant temperature indicator light, the warning light, and all segments of the meter display turn on and off once.



1. Tachometer
2. Low coolant temperature indicator light "≋"
3. Warning light "⚠"
4. Meter display
5. Select/reset button

The grip warmer level is initially displayed for 5 seconds, then the display switches to the fuel meter.

Odometer and tripmeter modes

Pushing the select/reset button switches the display between the odometer mode "ODO" and the tripmeter mode "TRIP".

To reset the tripmeter, push the select/reset button for at least one second while the tripmeter is displayed.

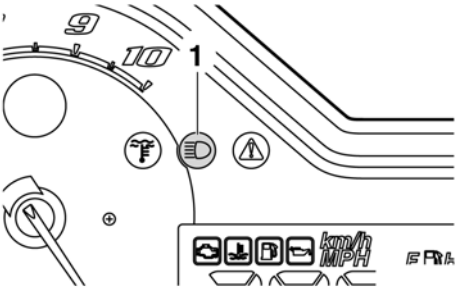
NOTE:

To switch the speedometer, odometer, and tripmeter displays between kilometers and miles, select the odometer mode "ODO", and then push the select/reset button for at least 10 seconds while the snowmobile is stopped.

ESU10410

High beam indicator light "≡D"

The high beam indicator light comes on when the high beams of the headlights are switched on. (See page 16 for headlight beam switch operation.)

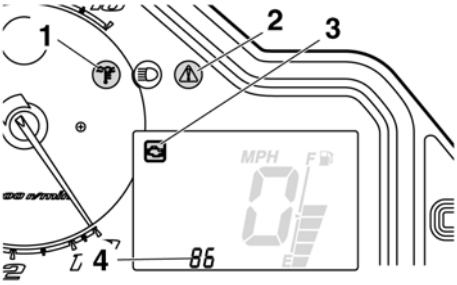


1. High beam indicator light "≡D"

ESU10481

Low coolant temperature indicator light "≋"

The low coolant temperature indicator light comes on when the coolant temperature is low and informs the rider that the snowmobile should be warmed up. After the engine is started, warm it up until the indicator light goes off.



1. Low coolant temperature indicator light "≋"
2. Warning light "⚠"
3. Self-diagnosis warning indicator "🔧"
4. Two-digit code "86"

The snowmobile can be operated normally after the indicator light goes off.

NOTE:

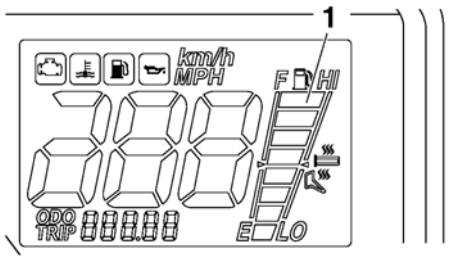
Operate the snowmobile at low speeds when the low coolant temperature indicator light is on. If the engine speed is too high, the warning light and self-diagnosis warning indicator will flash and the two-digit code "86" will flash

in the tripmeter/odometer display. When this occurs, maximum engine speed is reduced to protect the engine.

ESU10421

Fuel meter and grip/thumb warmer level indicator

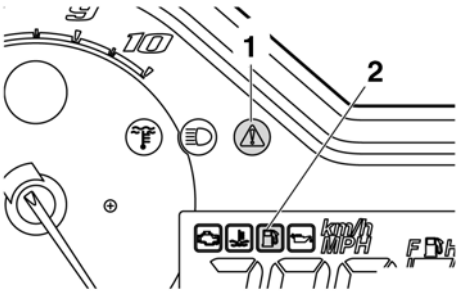
The fuel meter and grip/thumb warmer level indicator have eight segments which show the amount of fuel remaining in the fuel tank, the grip warmer level, or the thumb warmer level.



1. Fuel meter and grip/thumb warmer level indicator

Fuel meter

The display segments of the fuel meter disappear towards “E” (Empty) as the fuel level decreases. When only one segment is left near “E”, the fuel level warning indicator and the warning light come on.



1. Warning light “⚠”
2. Fuel level warning indicator “⛽”

If the fuel level warning indicator and the warning light come on, refuel as soon as possible.

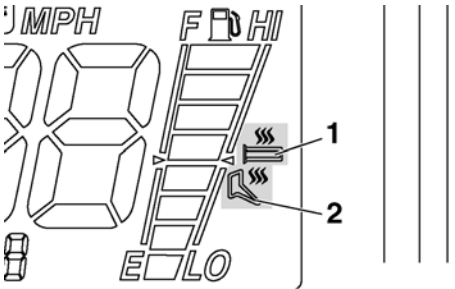
NOTE:

The snowmobile must be stopped on a level surface to obtain an accurate fuel meter reading, since the reading changes according to the movement and inclination of the snowmobile.

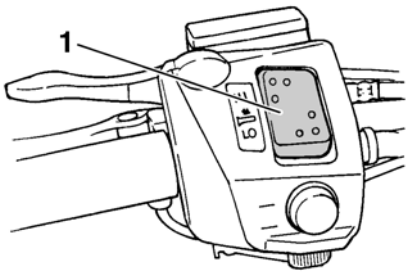
Grip/thumb warmer level indicator

When the grip warmer adjustment switch is pressed, the grip warmer indicator comes on and the display switches to the grip warmer level.

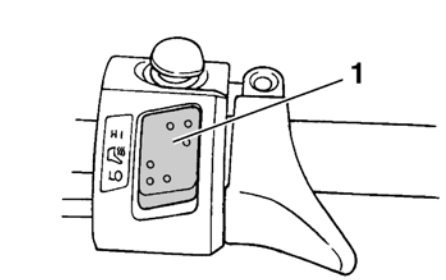
When the thumb warmer adjustment switch is pressed, the thumb warmer indicator comes on and the display switches to the thumb warmer level.



1. Grip warmer indicator “♨”
2. Thumb warmer indicator “🧤”



1. Grip warmer adjustment switch



1. Thumb warmer adjustment switch

NOTE:

- The grip/thumb warmer level is displayed for 5 seconds after releasing the grip/thumb warmer adjustment switch, then the display switches to the fuel meter.
- The top segment of the grip/thumb warmer level indicator flashes once when the grip/thumb warmer adjustment reaches the maximum level. The bottom segment of the grip/thumb warmer level indicator flashes once when the grip/thumb warmer adjustment reaches the minimum level.
- When the engine is started, the grip/thumb warmer levels are set to the levels selected when the engine is stopped.

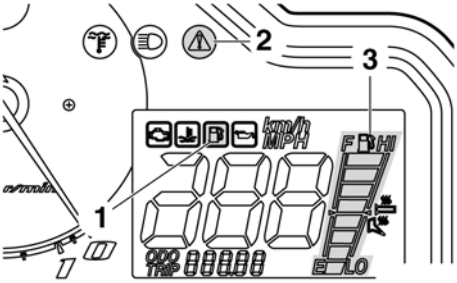
ESU10450

Fuel level warning indicator "⛽"

The fuel level warning indicator indicates a malfunctioning sensor, disconnected coupler, broken lead, or short circuit when detected by the self-diagnosis device of the snowmobile.

The fuel level warning indicator, warning light, and all segments of the fuel meter warn the rider of the above problems by flashing continuously.

When this occurs, have a Yamaha dealer inspect the snowmobile as soon as possible.

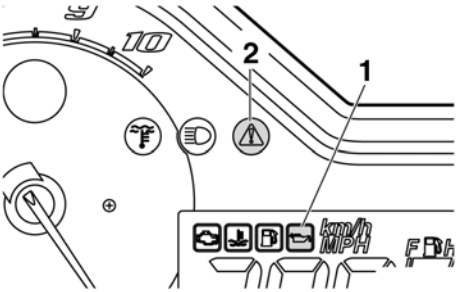


1. Fuel level warning indicator "⛽"
2. Warning light "⚠"
3. Fuel meter

ESU10460

Oil level warning indicator "🛢"

The oil level warning indicator and the warning light come on when the engine oil level is low.



1. Oil level warning indicator "🛢"
2. Warning light "⚠"

If the oil level warning indicator and the warning light come on, place the snowmobile on a level surface and allow it to idle for one minute.

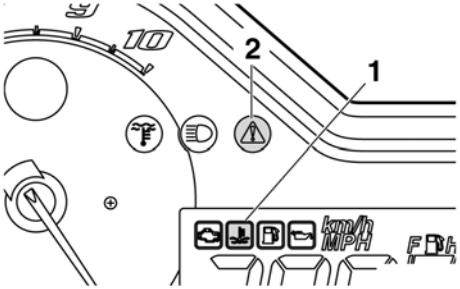
If the oil level warning indicator and the warning light go off, the engine oil level is sufficient, however it is getting low. Add engine oil as soon as possible.

If the oil level warning indicator and the warning light do not go off, check the engine oil level in the oil tank (see page 47 for engine oil level checking procedures), and add engine oil if necessary.

ESU10511

Coolant temperature warning indicator "🌡"

If the engine overheats, the coolant temperature warning indicator and the warning light come on. When this occurs, stop the engine immediately and allow the engine to cool down, and then check the coolant level in the coolant reservoir. (See page 50 for checking procedures.)



1. Coolant temperature warning indicator "🌡"
2. Warning light "⚠"

ECS00040

CAUTION:

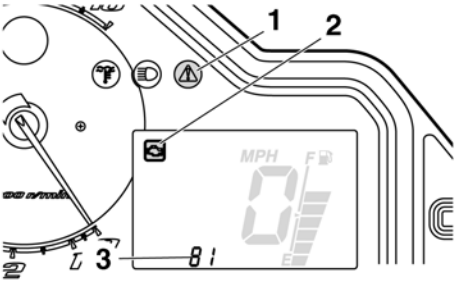
Do not operate the engine if it overheats.

ESU10522

Self-diagnosis device

This model is equipped with a self-diagnosis device for various electrical circuits.

If any of those circuits are defective, the warning light and the self-diagnosis warning indicator will flash, and a two-digit error code will flash slowly in the tripmeter/odometer display.



1. Warning light "⚠"
2. Self-diagnosis warning indicator "🔧"
3. Two-digit error code

EWS00052

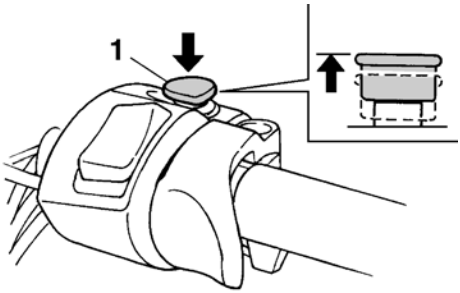
⚠ WARNING

- **If the self-diagnosis warning indicator and warning light flash continuously, and an error code is displayed during operation, there may be some problem with an electrical circuit, couplers, etc.**
- **Stop the engine and allow it to cool off. Then, check that the electrical circuits, couplers, etc. in the engine compartment are connected properly.**
- **If the self-diagnosis warning indicator, warning light, and an error code flash after the engine has been restarted, note the error code, and then have a Yamaha dealer inspect the snowmobile as soon as possible.**

ESU10530

Engine stop switch "⊠"

The engine stop switch is used to stop the engine in an emergency. Simply push the stop switch to stop the engine. To start the engine, pull the stop switch and proceed with starting the engine. (See pages 28 for engine starting procedures.)



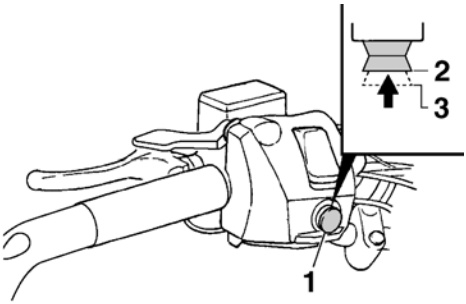
1. Engine stop switch“⊠”

During the first few rides, practice using the stop switch so that you can react quickly in an emergency.

ESU10661

Headlight beam switch “LIGHTS”

Push the headlight beam switch to change the headlight to high beam “HI” or to low beam “LO”.

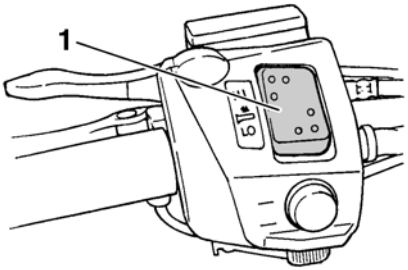


1. Headlight beam switch “LIGHTS”
2. High beam “HI”
3. Low beam “LO”

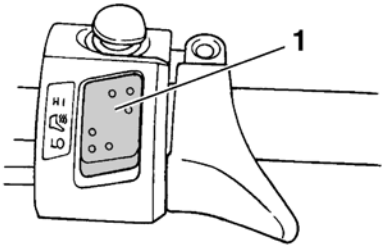
ESU12650

Grip/thumb warmer adjustment switch

The grip warmer adjustment switch and the thumb warmer adjustment switch control the electrically heated handlebar grips and throttle lever respectively.



1. Grip warmer adjustment switch



1. Thumb warmer adjustment switch

To raise the temperature, press the respective switch to “HI”. To lower the temperature, press the switch to “LO”.

ESU10690

Auxiliary DC jack (RS90GT / RS90GTA / RS90LTGT)

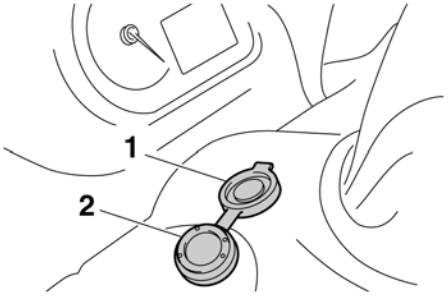
The auxiliary DC jack is located in the front panel and can be used for accessories.

NOTE:

The auxiliary DC jack cannot be used if the engine is not running.

To use the auxiliary DC jack

1. Start the engine.
2. Open the auxiliary DC jack cap, and then insert the accessory power plug into the jack.



1. Auxiliary DC jack cap
2. Auxiliary DC jack

NOTE:

After using the auxiliary DC jack, be sure to remove the accessory power plug from the jack and close the auxiliary DC jack cap.

ECS00120

CAUTION:

- **Do not use accessories requiring more than the maximum rated capacity for the auxiliary DC jack. This may overload the circuit and cause the fuse to blow. (See page 65 for the specified amperage.)**
- **Do not use an automotive cigarette lighter or other accessory with a plug that gets hot because the jack can be damaged.**

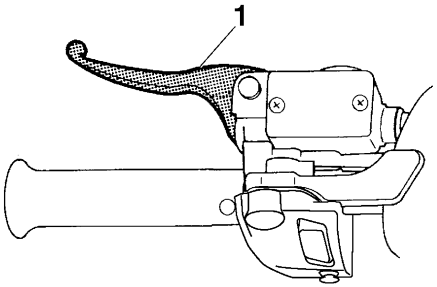
Maximum rated capacity:
DC 12 V, 2.5 A (30 W)

ESU10570

Brake lever

The snowmobile is stopped by braking the entire drive system.

Squeeze the brake lever towards the handlebar grip to stop the snowmobile.



1. Brake lever

NOTE:

When the brake lever is operated, the brake light will illuminate.

ECS00060

CAUTION:

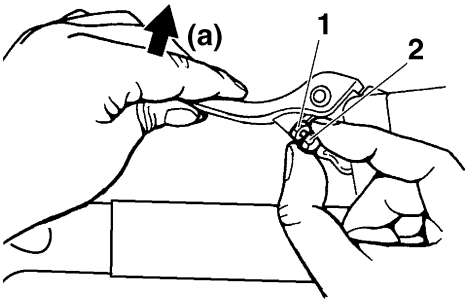
Make sure that the brake lever end does not project out over the handlebar end. This will help prevent brake lever damage when the snowmobile is placed on its side for service.

RS90GT / RS90GTA / RS90LTGT

The brake lever is equipped with a position adjuster.

To adjust the brake lever position:

1. Loosen the locknut.
2. While lightly pushing the brake lever in direction (a), finger tighten the adjusting bolt to set the brake lever to the desired position.



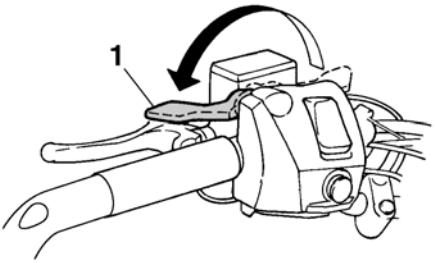
1. Locknut
2. Adjusting bolt

3. Tighten the locknut securely after adjusting the brake lever.

ESU10580

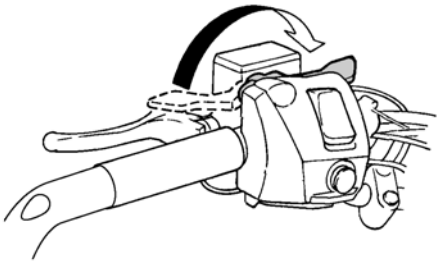
Parking brake lever

When parking the snowmobile or starting the engine, apply the parking brake by moving the parking brake lever to the left.



1. Parking brake lever

To release the parking brake, move the parking brake lever to the right.



EWS00060

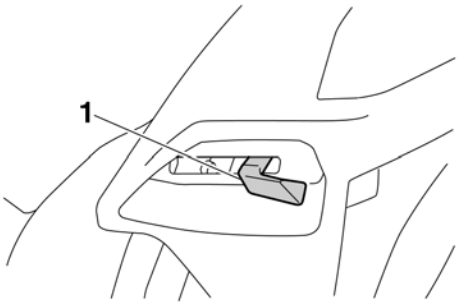
⚠ WARNING

- **Always set the parking brake before attempting to start the engine.**
- **Never run the snowmobile with the parking brake applied. This may overheat the brake disc and reduce braking ability.**

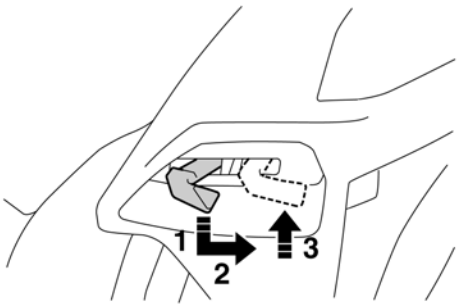
ESU10590

Shift lever

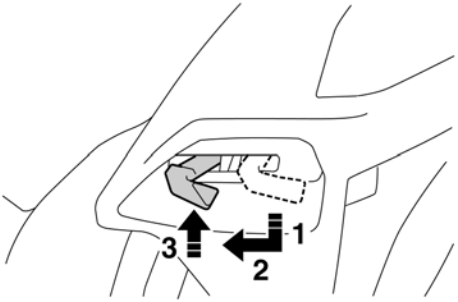
The shift lever is used to put the snowmobile into forward or reverse. After coming to a complete stop, pull the shift lever out, slide it to “FWD” or to “REV” until it stops, and then release it.



1. Shift lever



1. Pull out.
2. Slide to “FWD” (forward).
3. Release.



1. Pull out.
2. Slide to “REV” (reverse).
3. Release.

ECS00070

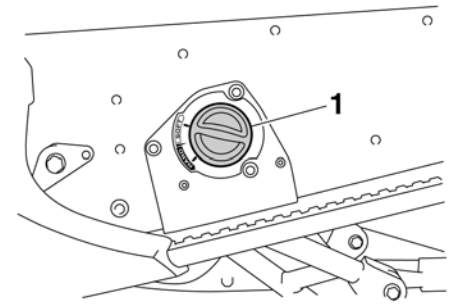
CAUTION:

Do not shift from “FWD” to “REV” or from “REV” to “FWD” while the snowmobile is moving. Otherwise, the drive system could be damaged.

ESU12530

Rear suspension damping force remote adjustment dial

Turn the remote adjustment dial to adjust the rear suspension damping force. (See page 24 for adjustment procedures.)

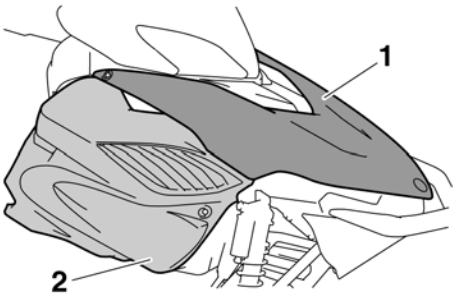


1. Rear suspension damping force remote adjustment dial

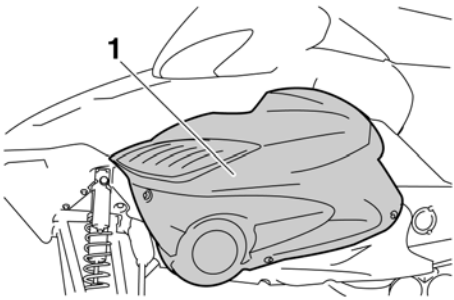
ESU10720

Shroud and covers

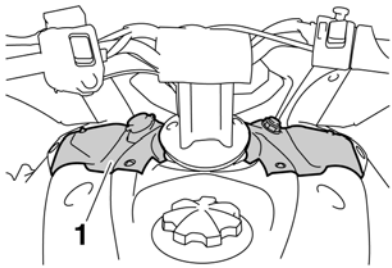
Securely fasten the shroud and covers before operating the snowmobile. (See page 40 for removal and installation procedures.)



1. Shroud
2. Right side cover



1. Left side cover



1. Top cover

EWS00090

⚠ WARNING

- **Do not drive the snowmobile with the shroud or covers unfastened or removed.**

- **Keep your body and clothing away from rotating parts when servicing the snowmobile with the shroud or covers removed.**
- **Do not touch the hot muffler and engine during or immediately after operation.**

ECS00370

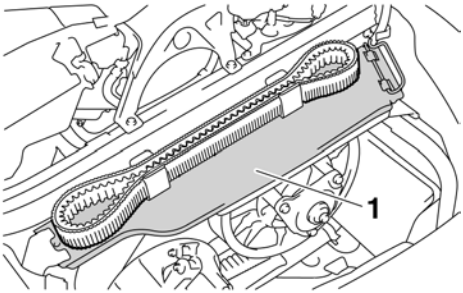
CAUTION:

Make sure that all cables, leads, etc., are routed properly before installing the shroud and covers.

ESU10750

Drive guard

The drive guard is designed to cover the V-belt clutch and V-belt in case parts break or come loose.



1. Drive guard

EWS00400

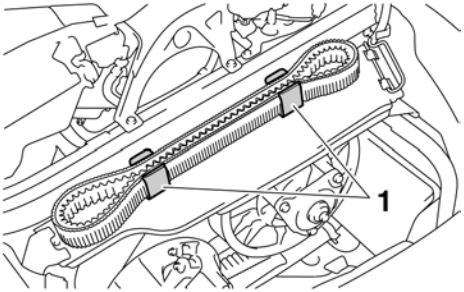
⚠ WARNING

- **Make sure that the drive guard is tightened securely before operating the snowmobile.**
- **Never run the engine with the V-belt or drive guard removed.**

ESU10760

V-belt holders

Keep a spare V-belt for emergency use by placing it into the V-belt holders provided.



1. V-belt holder

ECS00180

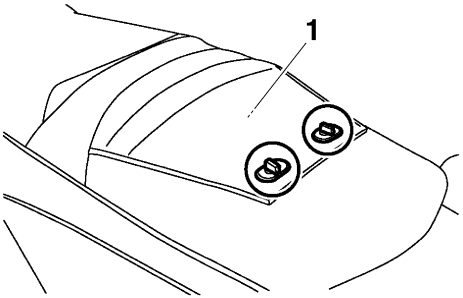
CAUTION:

Make sure that the V-belt is installed securely in the holders.

ESU10810

Storage compartment

Open the storage compartment to store the tool kit, spare parts, or other small items.



1. Storage compartment

ESU10600

Fuel

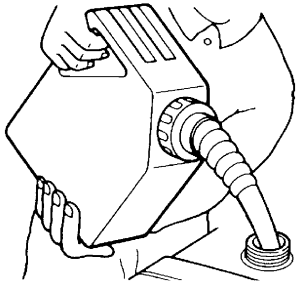
Make sure that there is sufficient fuel in the fuel tank.

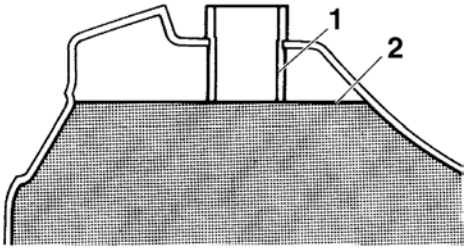
EWS00070

⚠ WARNING

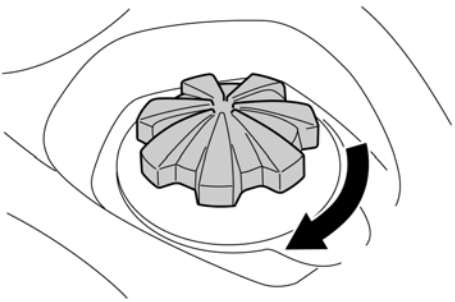
- **Fuel is HIGHLY FLAMMABLE and poisonous. Check the "SAFETY INFORMATION" section carefully before refueling. (See page 1.)**

- **Do not fill the fuel tank above the bottom of the filler tube. Fuel could overflow if the snowmobile is tilted or if the ambient temperature rises, causing the fuel to warm up and expand.**
- **Make sure that the fuel tank cap is closed securely after refueling. Leaking fuel can catch fire.**





1. Filler tube
2. Fuel level



Recommended fuel:
REGULAR UNLEADED GASOLINE ONLY
Fuel tank capacity:
36.2 L (9.64 US gal) (8.03 Imp.gal)

Your Yamaha engine has been designed to use regular unleaded gasoline with a pump octane number [(R+M)/2] of 86 or higher, or a research octane number of 91 or higher.

ECS00080

CAUTION:

- **Oxygenated fuels (gasohol) containing a maximum 5% of ethanol can be used, although richer jetting may be required to prevent engine damage. Consult a Yamaha dealer. Gasohol containing methanol is not recommended.**
- **Make sure that snow or ice does not enter the fuel tank when refueling.**
- **Do not use alcohol deicers or water absorbing additives with oxygenated fuel.**
- **The fuel tank should be filled with straight gasoline as specified.**

ESU10870

Suspension

The suspension can be adjusted to suit rider preference. A softer setting, for example, may provide greater rider comfort, while a harder setting may allow more precise handling and control over certain types of terrain or riding conditions.

EWS00150

⚠ WARNING

Be sure to have a Yamaha dealer make this adjustment.

This shock absorber contains highly pressurized nitrogen gas. It could explode by improper handling, causing injury, or property damage.

- **Do not tamper with or attempt to open the shock absorber.**

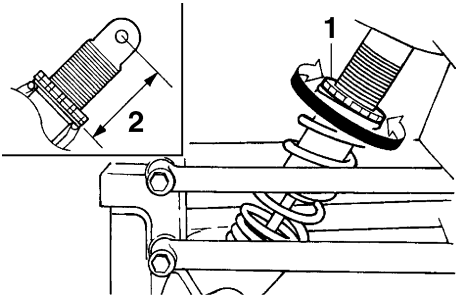
- **Do not subject the shock absorber to an open flame or other high heat source, which could cause it to explode.**
- **Do not deform or damage the shock absorber in any way.**
- **Do not dispose of a worn or damaged shock absorber by yourself. Take the unit to a Yamaha dealer.**

ESU10900
Adjusting the ski spring preload
ECS00250

CAUTION:

The left and right ski spring preload must be set to the same setting. Uneven settings can cause poor handling and loss of stability.

The spring preload can be adjusted by turning the spring preload adjusting ring.



1. Spring preload adjusting ring
2. Spring seat length

Spring preload setting (spring seat length or spring preload adjusting ring position):
- Minimum (soft):
  RS90R / RS90LT 161.0 mm (6.34 in)
  RS90GT / RS90GTA / RS90LTGT 119.0 mm (4.69 in)
- Standard:
  RS90R / RS90LT 162.0 mm (6.38 in)
  RS90GT / RS90GTA / RS90LTGT 119.0 mm (4.69 in)
- Maximum (hard):
  RS90R / RS90LT 172.0 mm (6.77 in)
  RS90GT / RS90GTA / RS90LTGT 129.0 mm (5.08 in)

* The spring seat length changes approximately 1.5 mm (0.06 in) with each full turn of the adjusting ring.

ESU10921
Adjusting the ski damping force (RS90GT / RS90GTA / RS90LTGT)
ECS00260

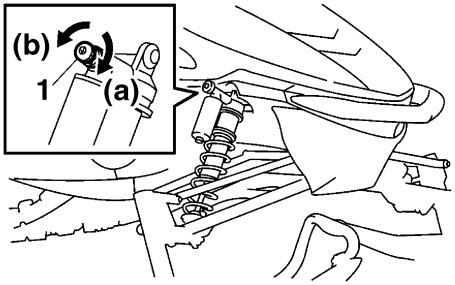
CAUTION:

The damping forces for the left and right ski shock absorbers must be adjusted to the same settings. Uneven settings can cause poor handling and loss of stability.

Compression damping force

The compression damping force of each ski shock absorber can be adjusted by turning the compression damping force adjusting knob.

To increase the compression damping force, turn the adjusting knob in direction (a). To decrease the compression damping force, turn the adjusting knob in direction (b).



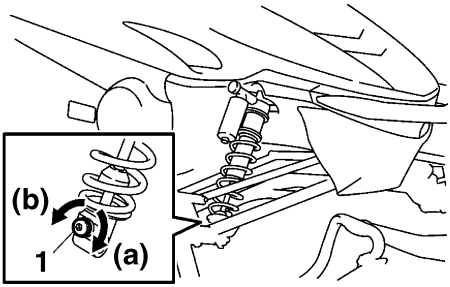
1. Compression damping force adjusting knob

Compression damping setting:
Minimum (soft):
12 click(s) in direction (b)*
Standard:
7 click(s) in direction (b)*
Maximum (hard):
2 click(s) in direction (b)*
* With the adjusting knob fully turned in direction (a)

Rebound damping force

The rebound damping force of each ski shock absorber can be adjusted by turning the rebound damping force adjusting knob.

To increase the rebound damping force, turn the adjusting knob in direction (a). To decrease the rebound damping force, turn the adjusting knob in direction (b).



1. Rebound damping force adjusting knob

Rebound damping setting:
Minimum (soft):
20 click(s) in direction (b)*
Standard:
12 click(s) in direction (b)*
Maximum (hard):
3 click(s) in direction (b)*
* With the adjusting knob fully turned in direction (a)

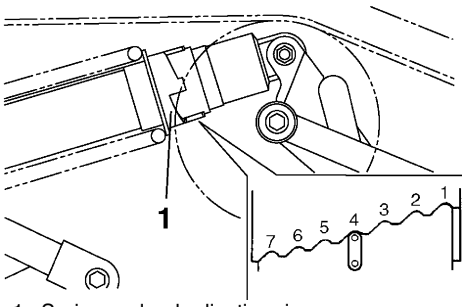
NOTE:

The damping forces will not decrease past the minimum levels even if the adjusting knobs are turned out more than the minimum settings.

ESU10980

Adjusting the rear suspension spring preload

The rear suspension spring preload can be adjusted by turning the spring preload adjusting ring on the shock absorber.



1. Spring preload adjusting ring

Spring preload setting (spring seat length or spring preload adjusting ring position):
Minimum (soft):
1
Standard:
4
Maximum (hard):
7
* The spring seat length changes approximately 1.5 mm (0.06 in) with each full turn of the adjusting ring.

NOTE:

The rear suspension spring preload can be further adjusted by changing the position of the spring seat.

Have a Yamaha dealer make this adjustment as it requires special tools.

ESU10991

Adjusting the rear suspension damping force

EWS00160

⚠ WARNING

Do not turn the remote adjustment dial while the snowmobile is moving as this could cause loss of control, an accident, and injury.

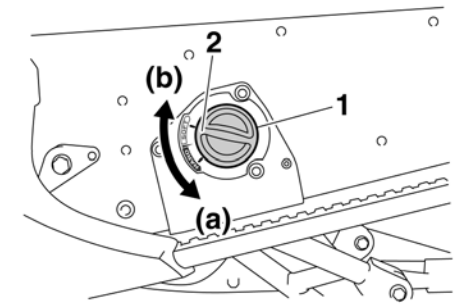
ECS00290

CAUTION:

Be sure to stop the remote adjustment dial at a marked position around the dial where there is a click.

The rebound damping force can be adjusted by turning the rear suspension damping force remote adjustment dial.

To increase the rebound damping force, turn the adjusting dial in direction (a). To decrease the rebound damping force, turn the adjusting dial in direction (b).



1. Rear suspension damping force remote adjustment dial
2. Standard position

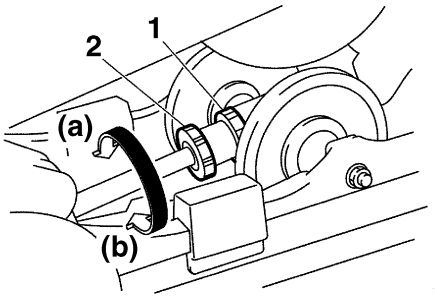
Rebound damping setting:
Minimum (soft):
22 click(s) in direction (a)*
Maximum (hard):
0 click(s) in direction (b)*
* With the adjustment dial in the standard position

ESU11050

Adjusting the control rod

The weight transfer can be adjusted by turning the control rod adjuster or adjusting nut.

1. Loosen the locknut.
2. Turn the control rod adjuster in direction (a) to increase weight transfer or direction (b) to decrease weight transfer.



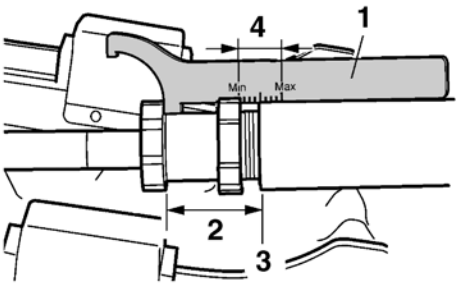
1. Locknut
2. Control rod adjuster

EWS00180

⚠ WARNING

Never adjust the control rod beyond the range of the scale on the special wrench.

3. Check the control rod adjuster length using the scale on the special wrench included in the owner's tool kit as shown. Make sure that the rim of the control rod body is within the range of the scale.



1. Special wrench
2. Adjuster length
3. Rim
4. Scale range

4. Tighten the locknut while holding the control rod adjuster in place.

Locknut tightening torque: 35 Nm (3.5 m·kgf, 25 ft·lb)

ECS00320

CAUTION:

When using the special wrench, make sure that it is situated at a right angle to the control rod, and that it is tightly fitted to the locknut or the control rod adjuster.

Pre-operation checks

ESU11070

The condition of a snowmobile is the owner's responsibility. Vital components can start to deteriorate quickly and unexpectedly, even if the snowmobile remains unused (for example, as a result of exposure to the elements). Any damage or fluid leakage could have serious consequences. Therefore, it is very important, in addition to a thorough visual inspection, to check the following points before each ride.

NOTE:

Pre-operation checks should be made each time the snowmobile is used. Such an inspection can be accomplished in a very short time; and the added safety it assures is more than worth the time involved.

EWS00190

WARNING

If any item in the pre-operation check list is not working properly, have it inspected and repaired before operating the snowmobile.

ESU11080

Pre-operation check list

ITEM	CHECKS	PAGE
Fuel	• Check fuel level. • Refuel if necessary. • Check fuel line for leakage.	20
Engine oil	• Check oil level in engine. • If necessary, add recommended oil to specified level. • Check vehicle for oil leakage.	47
Coolant	• Check coolant level. • Add if necessary.	50
V-belt	• Check for wear and damage. • Replace if necessary.	52
Drive guard	• Make sure that drive guard is tightened securely. • Check the drive guard mounts for damage. • Make sure that the drive guard is firmly in place.	20
Brake	• Check operation. • If soft or spongy, have Yamaha dealer bleed hydraulic system. • Check brake pads for wear. • Replace if necessary. • Check fluid level in master cylinder. • If necessary, add recommended brake fluid to specified level. • Check hydraulic system for leakage.	56
Air filter	• Check that there is no snow under the air filter element. • If necessary, brush off the snow.	44

ITEM	CHECKS	PAGE
Tool kit and recommended equipment	• Check for proper placement.	40
Shroud and covers	• Make sure that the shroud and covers are securely fastened.	19
Skis and ski runners	• Check for wear and damage. • If necessary, have Yamaha dealer replace skis or ski runners.	58
Drive track	• Check for deflection, wear and damage. • If necessary, have Yamaha dealer replace track.	59
Slide runners	• Check for wear and damage. • If necessary, have Yamaha dealer replace slide runners.	59
Steering	• Check for excessive free play.	59
Lights, signals and switches	• Check operation. • Correct if necessary.	16, 15, 63, 64
Throttle lever	• Make sure that operation is smooth and spring back to its home position when released.	9
Throttle override system (T.O.R.S.)	• Check the T.O.R.S. for proper operation. • If system is defective, have Yamaha dealer check vehicle.	44

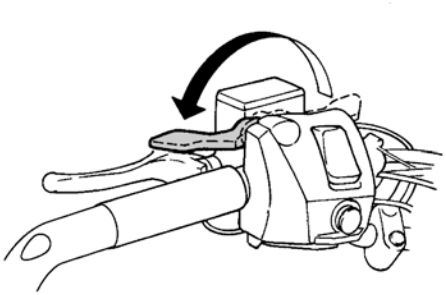
ESU11290

Starting the engine

EWS00200

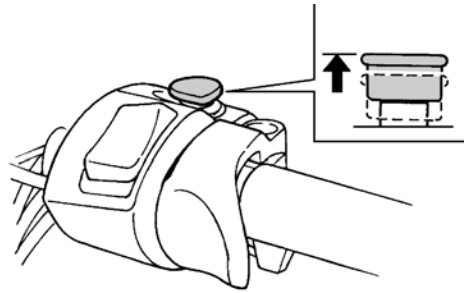
⚠ WARNING

- **Be sure to check the "SAFETY INFORMATION" section carefully before starting the engine.**
- **Make sure that the parking brake is applied.**



NOTE:

Make sure that the engine stop switch is in the on position. The starter motor cannot be operated when the engine stop switch is in the off position.

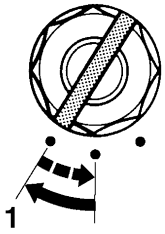


1. Fully open the starter (choke) lever.

NOTE:

The starter (choke) lever is not required when the engine is warm. Put the starter (choke) lever in the closed position.

2. Turn the main switch to the start position. After the engine starts, put the starter (choke) lever in the half-open position. Warm up the engine until it does not run roughly or begin to stall when the starter (choke) lever is returned to the closed position.



1. Start

ECS00330

CAUTION:

- **Release the switch immediately after the engine starts.**
- **If the engine fails to start, release the switch, wait a few seconds, then try again. Each attempt should be as short as possible to preserve the battery. Do not crank the engine more than 10 seconds on any one attempt.**

ESU11310

Break-in

There is never a more important period in the life of your engine than the period between 0 and 500 km (300 mi). For this reason, you should read the following material carefully.

Since the engine is brand new, do not put an excessive load on it for the first 500 km (300 mi). The various parts in the engine wear and polish themselves to the correct operating clearances. During this period, prolonged full-throttle operation or any condition that might result in engine overheating must be avoided.

Operating your snowmobile for the first time

Start the engine and let it idle for 15 minutes.

0–160 km (0–100 mi)

Avoid prolonged operation above 6000 r/min.

160–500 km (100–300 mi)

Avoid prolonged operation above 8000 r/min.

500 km (300 mi) and beyond

The snowmobile can now be operated normally.

ECS00340

CAUTION:

- **After 800 km (500 mi) of operation, the engine oil must be changed and the oil filter cartridge replaced.**
- **If any engine trouble should occur during the engine break-in period, immediately have a Yamaha dealer check the snowmobile.**

ESU11331

Riding your snowmobile

Getting to know your snowmobile

A snowmobile is a rider active vehicle, and your riding position and your balance are the two basic factors of maneuvering your snowmobile.

Riding your snowmobile requires skills acquired through practice over a period of time. Take the time to learn the basic techniques well before attempting more difficult maneuvers.

Riding your new snowmobile can be a very enjoyable activity, providing you with hours of pleasure. However, it is essential to familiarize yourself with the operation of the snowmobile to achieve the skill necessary to enjoy riding safely. Before operating the snowmobile, read this Owner's Manual completely and understand the operation of the controls. Pay particular attention to the safety information on page 1.

Please read all warning and caution labels on your snowmobile. Also, read the Snowmobiler's Safety Handbook that is supplied with your snowmobile.

Learning to ride your snowmobile

Before you ride, always perform the pre-operation checks listed on page 26. The short time spent checking the condition of the snowmobile will be rewarded with added safety and a more reliable snowmobile. Always wear the proper clothing for both warmth and to help protect you from injury if an accident occurs.

Become familiar with operating your snowmobile at low speeds, even if you are an experienced rider. Do not attempt to operate at maximum performance until you are totally familiar with the snowmobile's handling and performance characteristics.

The beginning operator should select a large flat area to become familiar with the snowmobile. Make sure that this area is free of obstacles and other traffic. You should practice control of the throttle and brake, and master turning techniques in this area before trying more difficult terrain.

Set the parking brake and follow the instructions on page 28 to start the engine. Once the engine has warmed up, you are ready to begin riding your snowmobile.

To start out and accelerate

1. With the engine idling, release the parking brake.
2. Apply the throttle slowly and smoothly. The V-belt clutch will engage and you will start to accelerate.

EWS00210

⚠ WARNING

The operator should always keep both hands on the handlebar. Never put your feet outside the running boards. Avoid

high speeds until you have become thoroughly familiar with your snowmobile and all of its controls.

Braking

When slowing down or stopping, release the throttle and apply the brake gently—not suddenly.

EWS00220

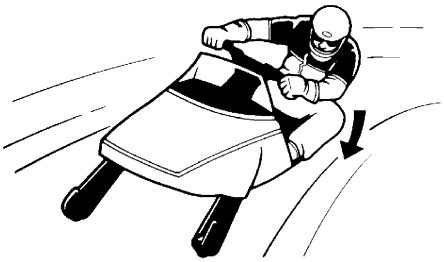
⚠ WARNING

- **Many surfaces such as ice and hard-packed snow require much longer stopping distances. Be alert, plan ahead, and begin decelerating early.**
- **Improper use of the brake can cause the drive track to lose traction, reduce control, and increase the possibility of an accident.**

Turning

For most snow surfaces, “body English” is the key to turning.

As you approach a curve, slow down and begin to turn the handlebar in the desired direction. As you do so, put your weight on the running board to the inside of the turn and lean your upper body into the turn.



This procedure should be practiced at low speeds many times, in a large flat area with no obstacles. Once you have learned this technique, you should be able to perform it at higher speeds or in tighter curves. Lean more as the turn gets sharper or is made at higher speeds.

Improper riding techniques such as abrupt throttle changes, excessive braking, incorrect body movements, or too much speed for the sharpness of the turn may cause the snowmobile to tip.

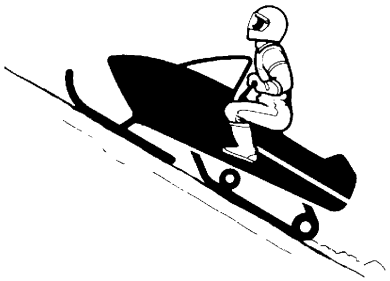
If your snowmobile begins to tip while turning, lean more into the turn to regain balance. If necessary, gradually let off on the throttle or steer to the outside of the turn.

Remember:

Avoid higher speeds until you are thoroughly familiar with the operation of your snowmobile.

Riding uphill

You should practice first on gentle slopes. Try more difficult climbs only after you have developed your skill. As you approach a hill, accelerate before you start the climb, and then reduce the throttle to prevent track slippage. It is also important to keep your weight on the uphill side at all times. On climbs straight up the hill, this can be accomplished by leaning forward and, on steeper inclines, standing on the running boards and leaning forward over the handlebar. (Also see “Traversing a slope”.)



Slow down as you reach the crest of the hill, and be prepared to react to obstacles, sharp drops, or other vehicles or people which may

be on the other side. If you are unable to continue up a hill, do not spin the track. Stop the engine and set the parking brake. Then pull the rear of the snowmobile around to point the snowmobile back down the hill. When the snowmobile is pointed downhill, mount your snowmobile from the uphill side. Restart the engine, release the parking brake, and descend the hill.

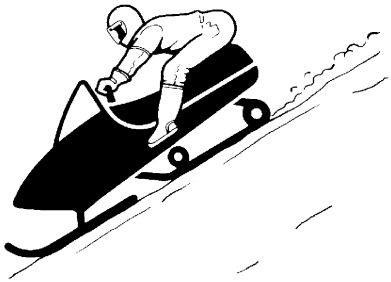
EWS00230

⚠ WARNING

Side hills and steep slopes are not recommended for a novice snowmobiler.

Riding downhill

When riding downhill, keep speed to a minimum. It is important to apply just enough throttle to keep the clutch engaged while descending the hill. This will allow you to use engine compression to help slow the snowmobile, and to keep the snowmobile from rolling freely down the hill. Also apply the brake frequently, with light pressure.



EWS00240

⚠ WARNING

Use extra caution when applying the brake during a descent. Excessive braking will cause the drive track to lock, causing a loss of control.

Traversing a slope

EWS00250

⚠ WARNING

Traversing slopes is not recommended for a novice snowmobiler.

Traversing a slope requires you to properly position your weight to maintain proper balance. As you travel across the slope, lean your body to position your weight towards the uphill side. A recommended riding position is to kneel with the knee of your downhill leg on the seat and the foot of your uphill leg on the running board. This position will make it easier for you to shift your body weight as needed.

Snow and ice are slippery, so be prepared for the possibility that your snowmobile could begin to slip sideways on the slope. If this happens, steer in the direction of the slide if there are no obstacles in your path. As you regain proper balance, gradually steer again in the direction you wish to travel.

If your snowmobile starts to tip, steer down the hill to regain balance.

EWS00260

⚠ WARNING

If you are unable to maintain correct balance, and your snowmobile is going to tip over, dismount your snowmobile immediately on the uphill side.

Ice or icy surface

Operating on ice or icy surfaces can be very dangerous. Traction for turning, stopping, and starting is much less than that on snow.

EWS00270

⚠ WARNING

When you have to operate on ice or icy surfaces, drive slowly and cautiously. Avoid accelerating, turning, and braking rapidly. Steering is minimal and uncontrolled spins are an ever-present danger.

Hard-packed snow

It can be more difficult to negotiate on hard-packed snow as both the skis and drive track do not have as much traction as when the snowmobile is operated on fresh snow. Avoid rapid acceleration, turning, and braking.

Operation on surfaces other than snow or ice

Operation of your snowmobile on surfaces other than snow or ice should be avoided. Operation under such conditions will damage or result in rapid wear of the ski runners, drive track, slide runners, and drive sprockets. Operation of the snowmobile on the following surfaces should be avoided at all times:

- Dirt
- Sand
- Rocks
- Grass
- Bare pavement

Other surfaces that should be avoided for the sake of drive track and slide runner life are:

- Glare ice surfaces
- Snow mixed with a lot of dirt and sand

All of the above surfaces have one thing in common in regard to drive track and slide runners: little or no lubricating ability. Drive track and all slide rail systems require lubrication (snow or water) between the slide runners and the slide metal. In the absence of lubrication, the slide runners will rapidly wear and in severe cases, literally melt away, and the drive track will be subject to damage or failure. Also traction aids such as studs, cleats, etc., may cause further track damage or failure.

EWS00280

⚠ WARNING

Drive track damage or failure could result in loss of braking ability and snowmobile control, which could cause an accident.

- **Always check the drive track for damage or maladjustment before operating the snowmobile.**
- **Do not operate the snowmobile if you find damage to the drive track.**

ECS00350

CAUTION:

Ride on fresh snow frequently. Operating on ice or hard-packed snow will rapidly wear the slide runners.

ESU11350

Maximizing drive track life

Recommendations

Track tension

During initial break-in, the new drive track will tend to stretch quickly as the track settles. Be sure to correct the track tension and alignment frequently. (See page 59 for adjustment procedures.) A loose track can slip (ratchet), derail or catch on suspension parts causing severe damage. Do not overtighten the drive track, otherwise it may increase the friction between the track and the slide runners, resulting in the rapid wear of both components. Also, this may put an excessive load on the suspension components, resulting in component failure.

Marginal snow

The drive track and the slide runners are lubricated and cooled by snow and water. To prevent the drive track and slide runners from overheating, avoid sustained high-speed us-

age in areas such as icy trails, frozen lakes and rivers that have minimal snow coverage. An overheated track will be weakened internally, which may cause failure or damage.

Off-trail riding

Avoid off-trail riding until there is sufficient snow coverage. It generally takes several feet of snow to provide a good overall base to properly cover debris, such as rocks, logs, etc. If snow coverage is not sufficient, stay on trails to avoid impact damage to the drive track.

Studded track

In general, track life will be shortened when studs are installed. Drilling stud holes into the drive track will cut the internal fibers, which weakens the track. Avoid spinning the drive track. Studs may catch on an object and pull out of the track, leaving tears and damage around the already weakened area. To minimize possible damage, consult your stud manufacturer for installation and stud pattern recommendations.

Yamaha does not recommend track studding.

ESU11390

Driving

EWS00300

⚠ WARNING

Be sure to read the "SAFETY INFORMATION" section on page 1 and the "Riding your snowmobile" section on page 29 carefully before operating the snowmobile.

NOTE:

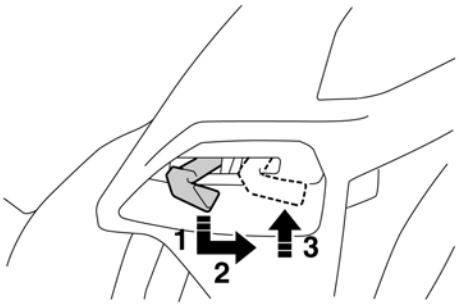
Make sure that the engine is warmed up enough before riding.

EWS00310

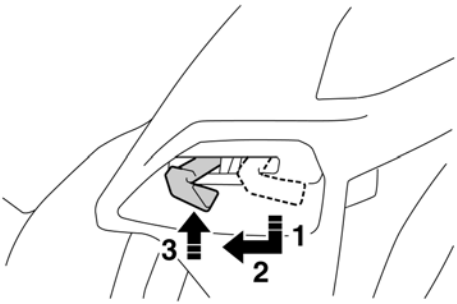
⚠ WARNING

- **Make sure that the throttle lever is fully released and the snowmobile is at a full stop before shifting.**
- **Be sure to slide the shift lever to "FWD" or "REV" until it stops completely and only while the engine is idling.**
- **Make sure that the area behind the snowmobile is clear before reversing. Watch behind.**
- **Reduce speed and avoid sharp turning when operating the snowmobile in reverse.**

1. To select the desired operating position, pull the shift lever out, slide it to "FWD" or to "REV" until it stops, and then release it.



1. Pull out.
2. Slide to "FWD" (forward).
3. Release.



1. Pull out.
2. Slide to “REV” (reverse).
3. Release.

ECS00070

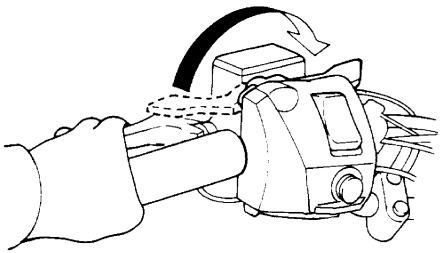
CAUTION:

Do not shift from “FWD” to “REV” or from “REV” to “FWD” while the snowmobile is moving. Otherwise, the drive system could be damaged.

NOTE:

The reverse buzzer beeps while the shift lever is in reverse.

2. Release the parking brake by moving the parking brake lever to the right.



3. Press the throttle lever slowly to move the snowmobile.
4. Turn the handlebar in the desired direction.
5. Squeeze the brake lever to stop the snowmobile.
6. Apply the parking brake by moving the parking brake lever to the left.

ESU11410

Stopping the engine

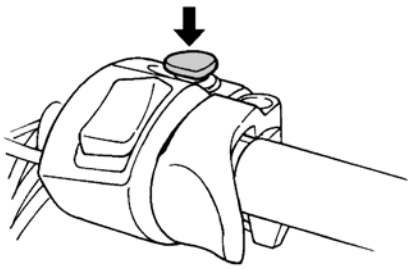
Turn the main switch to the off position to stop the engine.

1. Off

EWS00330

⚠ WARNING

- **Push down the engine stop switch to stop the engine in an emergency.**
- **Make sure that the key is removed from the main switch whenever the operator leaves the snowmobile, to prevent accidental starting.**



ESU11420

Transporting

When transporting your snowmobile on a trailer or in a truck, observe the following recommendations to help protect it from damage:

- Make sure that the fuel level in the fuel tank is lower than the bottom of the carburetors. Otherwise, the vibration and bumps from the road surface could make it possible for fuel to flow through the carburetors into the cylinders. This can result in “hydrostatic lock,” a condition where the engine cannot rotate because of fuel accumulated in the engine. Severe engine damage can result from hydrostatic lock. When possible, the fuel tank should be empty during transportation, especially if the trip takes longer than 30 minutes.
- If transporting the snowmobile in an open trailer or truck, put a tight fitting cover on the snowmobile. A cover specifically designed for your snowmobile is best. This will help keep foreign objects out of the cooling vents in the shroud, and also help protect the snowmobile against damage from debris on the road.
- If transporting the snowmobile in an open trailer or truck in areas where road salt is used, coat metal suspension surfaces lightly with oil or another protectant. This will help protect against corrosion. Be sure to clean the snowmobile when you get to your destination to remove any corrosive salts.

Periodic maintenance

ESU11450

Safety is an obligation of the owner. Periodic inspection, adjustment, and lubrication will keep your snowmobile in the safest and most efficient condition possible. The most important points of snowmobile inspection, adjustment, and lubrication are explained on the following pages.
Maintenance, replacement, or repair of the emission control devices and systems may be performed by any repair establishment or individual that is certified (if applicable).

EWS00340

⚠ WARNING

If you are not familiar with maintenance work, have a Yamaha dealer do it for you.

PROPER PERIODIC MAINTENANCE OF YOUR SNOWMOBILE IS IMPORTANT IN ORDER TO ENJOY LONG, PLEASURABLE SERVICE. ESPECIALLY IMPORTANT ARE THE MAINTENANCE SERVICES RELATED TO EMISSION CONTROL. THESE CONTROLS NOT ONLY FUNCTION TO ENSURE CLEANER AIR, BUT ARE ALSO VITAL TO PROPER ENGINE OPERATION AND MAXIMUM PERFORMANCE. IN THE FOLLOWING PERIODIC MAINTENANCE CHARTS, THE SERVICES RELATED TO EMISSION CONTROL ARE GROUPED SEPARATELY. THESE SERVICES REQUIRE SPECIALIZED DATA, KNOWLEDGE, AND EQUIPMENT. YAMAHA DEALERS ARE TRAINED AND EQUIPPED TO PERFORM THESE PARTICULAR SERVICES.

ESU11460

Periodic maintenance chart for the emission control system

	ITEM	REMARKS	INITIAL	EVERY	PAGE
			1 month or 800 km (500 mi) (40 hr)	Seasonally or 4000 km (2500 mi) (200 hr)	
	Spark plugs	• Check condition. • Adjust gap and clean. • Replace if necessary.		●	42
*	**Valve clearance**	• Check and adjust valve clearance when engine is cold.	Every 40000 km (25000 mi)		46
*	**Crankcase breather system**	• Check breather hose for cracks or damage. • Replace if necessary.		●	—
*	**Fuel filter**	• Check condition. • Replace if necessary.		●	—
*	**Fuel line**	• Check fuel hose for cracks or damage. • Replace if necessary.		●	—
*	**Idle speed**	• Check and adjust idle speed.	●	●	43

	ITEM	REMARKS	INITIAL	EVERY	PAGE
			1 month or 800 km (500 mi) (40 hr)	Seasonally or 4000 km (2500 mi) (200 hr)	
*	**Carburetors**	• Adjust synchronization.	●	●	—
		• Adjust the jets.	Whenever operating condition (elevation/temperature) is changed.		46
*	**Exhaust system**	• Check for leakage. • Tighten or replace gasket if necessary.		●	—

* It is recommended that these items be serviced by a Yamaha dealer.

ESU11560

General maintenance and lubrication chart

	ITEM	REMARKS	INITIAL	EVERY	PAGE
			1 month or 800 km (500 mi) (40 hr)	Seasonally or 4000 km (2500 mi) (200 hr)	
	Engine oil	• Change (warm engine before draining)	●	●	47
*	**Engine oil filter cartridge**	• Replace.	●	Every 20000 km (12000 mi)	47
*	**Cooling system**	• Check coolant level. • Air bleed the cooling system if necessary.		●	50
*	**Primary and secondary clutches**	• Check engagement and shift speed. • Adjust if necessary.		●	—
			Whenever operating elevation is changed.		—
		• Inspect sheaves for wear and damage. • Inspect weights/rollers and bushings for wear for primary. • Inspect ramp shoes/bushings for wear for secondary. • Replace if necessary.		●	—
		• Lubricate with specified grease.		●	—
*	**Drive chain**	• Check chain slack. • Adjust if necessary.	Initial at 500 km (300 mi) and every 800 km (500 mi) thereafter.		55
*	**Drive chain oil**	• Check oil level.	●	●	55
		• Change.		●	55
*	**Brake and parking brake**	• Adjust free play and/or replace pads if necessary.		●	56
		• Change brake fluid.	See NOTE following this chart.		56
	Control cables	• Make sure that operation is smooth. • Lubricate if necessary.		●	62
*	**Disc brake installation**	• Check for slight free play. • Lubricate shaft with specified grease as required.	Every 1600 km (1000 mi)		—
*	**Slide runners**	• Check for wear and damage. • Replace if necessary.		●	59
*	**Skis and ski runners**	• Check for wear and damage. • Replace if necessary.		●	58

	ITEM	REMARKS	INITIAL	EVERY	PAGE
			1 month or 800 km (500 mi) (40 hr)	Seasonally or 4000 km (2500 mi) (200 hr)	
*	**Steering system**	• Check toe-out. • Adjust if necessary.		●	59
*	**Steering bearings**	• Check bearing assemblies for looseness. • Lubricate with specified grease.		●	—
*	**Ski and front suspension**	• Lubricate with specified grease.		●	62
*	**Suspension component**	• Lubricate with specified grease.		●	62
	Fittings and fasteners	• Make sure that all nuts, bolts and screws are properly tightened. • Tighten if necessary.	●	●	64
*	**Battery**	• Check condition. • Charge if necessary.		●	64

* It is recommended that these items be serviced by a Yamaha dealer.

NOTE:

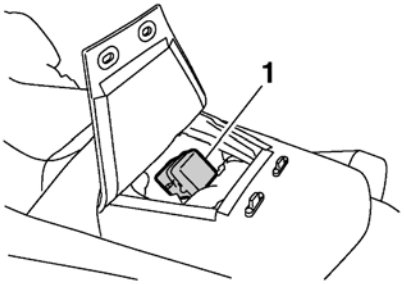
Brake system:

- After disassembling the master cylinder or caliper cylinder, always change the brake fluid. Regularly check the brake fluid level and add fluid if necessary.
- Replace the oil seals of the master cylinder and caliper cylinder every two years.
- Replace the brake hose every four years, or if cracked or damaged.

ESU11740

Tool kit

The owner's tool kit has the tools which are sufficient for most periodic maintenance and minor repairs. A torque wrench is also necessary to properly tighten nuts and bolts.



1. Tool kit

ECS00360

CAUTION:

Before starting the engine, make sure that the tool kit is properly seated in its holder and is securely fastened.

NOTE:

If you do not have a torque wrench available during a service operation requiring one, take your snowmobile to a Yamaha dealer to check the torque settings and adjust them if necessary.

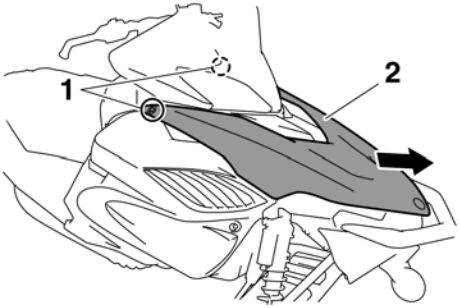
ESU12891

Removing and installing the shroud and covers

Shroud

To remove the shroud

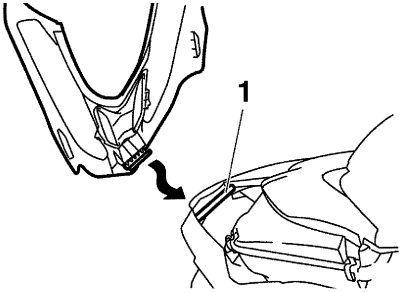
Loosen the fasteners, slowly raise the shroud, and then unhook the shroud from the shroud stay.



1. Fastener
2. Shroud

To install the shroud

Hook the end of the shroud onto the shroud stay, slowly lower it to the original position, and then tighten the fasteners.

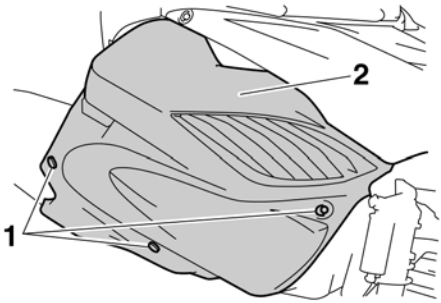


1. Shroud stay

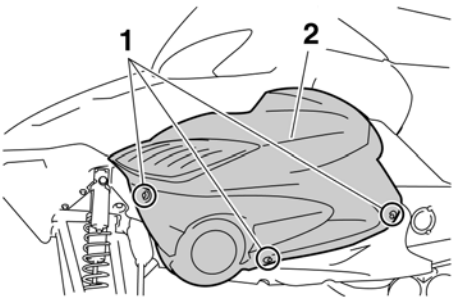
Left and right side covers

To remove a side cover

1. Remove the shroud. (See the above procedure.)
2. Loosen the fasteners, and then remove the side cover.



1. Fastener
2. Right side cover



1. Fastener
2. Left side cover

To install a side cover

1. Place the side cover in the original position, and then tighten the fasteners.
2. Install the shroud.

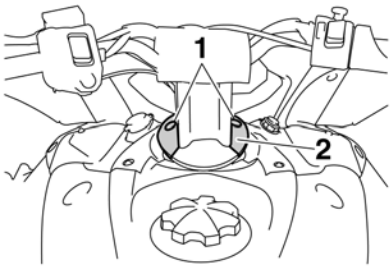
NOTE:

Be sure to fit the projection on the rear of the side cover into the hole in the lower side cover.

Top cover

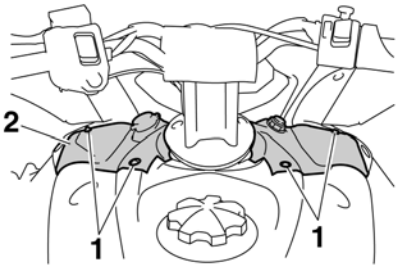
To remove the top cover

1. Remove the shroud. (See the above procedure.)
2. Remove the screws, and then remove the cable guide.



1. Screw
2. Cable guide

3. Loosen the quick fastener screws, disconnect the main switch coupler and auxiliary DC jack coupler (RS90GT / RS90GTA / RS90LTGT), and then remove the top cover.



1. Quick fastener screw
2. Top cover

To install the top cover

1. Connect the main switch coupler and auxiliary DC jack coupler (RS90GT / RS90GTA / RS90LTGT), place the top cover in the original position, and then tighten the quick fastener screws.
2. Pass all of the cables, etc., through the cable guide, place the cable guide in the original position, and then install the screws.
3. Install the shroud.

EWS00090

⚠ WARNING

- **Do not drive the snowmobile with the shroud or covers unfastened or removed.**
- **Keep your body and clothing away from rotating parts when servicing the snowmobile with the shroud or covers removed.**
- **Do not touch the hot muffler and engine during or immediately after operation.**

ECS00370

CAUTION:

Make sure that all cables, leads, etc., are routed properly before installing the shroud and covers.

NOTE:

When installing the shroud and covers, be sure to tighten all fasteners securely.

ESU11780

Checking the spark plugs

The spark plug is an important engine component and is easy to inspect. The condition of the spark plug can indicate the condition of the engine.

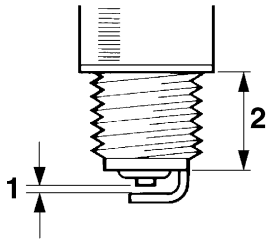
Check the coloration on the white porcelain insulator around the center electrode. The ideal coloration at this point is a medium to a light tan color for a snowmobile that is being ridden normally. If a spark plug shows a distinctly different color, there could be something wrong with the engine. For example, a very white center electrode porcelain color could indicate an intake track air leak or carburetion problem for that cylinder. Do not attempt to diagnose such problems yourself. Instead, take the snowmobile to a Yamaha dealer for inspection and possible repairs.

You should periodically remove and inspect the spark plug because heat and deposits will cause a spark plug to slowly break down and erode. Consult a Yamaha dealer before changing to a different type of spark plug.

Specified spark plug:
Manufacturer:
NGK
Model:
CR8E

Spark plugs are produced in several different thread lengths. The thread length or reach is the distance from the spark plug gasket seat to the end of the threaded portion. If the reach is too long, overheating and engine damage may result. If the reach is too short, spark plug fouling and poor performance may result. Also, if the reach is too short, carbon will form on the exposed threads resulting in combustion chamber hot spots and thread damage. Always use a spark plug with the specified reach.

Spark plug reach:
19.0 mm (0.75 in)



1. Spark plug gap
2. Spark plug reach

Before installing any spark plug, measure the electrode gap with a wire thickness gauge and adjust to specification.

Spark plug gap:
0.7–0.8 mm (0.028–0.031 in)

When installing the spark plug, always clean the gasket surface. Wipe off any grime from the threads and tighten the spark plug to the specified torque.

Spark plug tightening torque:
12.5 Nm (1.25 m·kgf, 9 ft·lb)

ECS00380

CAUTION:

Make sure that the spark plug caps are securely installed. Otherwise the spark plug caps could be damaged due to engine vibration.

ESU12900

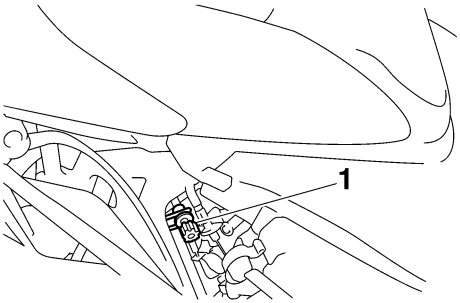
Adjusting the engine idling speed

ECS00390

CAUTION:

- **Be sure to have a Yamaha dealer make this adjustment.**
- **Make sure that the throttle lever moves smoothly.**
- **Make sure that the carburetor is synchronized first.**

1. Remove the shroud. (See page 40 for removal procedures.)
2. Start the engine and warm it up.
3. Turn the throttle stop screw in or out to adjust the engine idling speed.



1. Throttle stop screw

Standard engine idling speed:
1300–1500 r/min

4. Install the shroud.

ESU12910

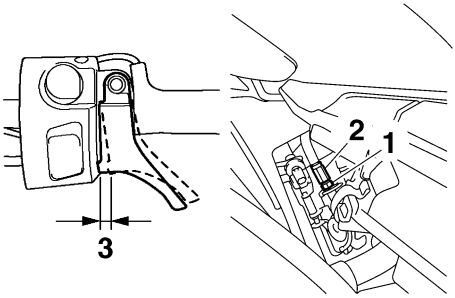
Adjusting the throttle cable free play

ECS00410

CAUTION:

Be sure to adjust the engine idling speed first.

1. Remove the shroud and the right side cover. (See page 40 for removal procedures.)
2. Loosen the locknut.
3. Turn the adjusting bolt in or out until the specified throttle cable free play is obtained.



1. Locknut
2. Throttle cable free play adjusting bolt
3. Throttle cable free play

Throttle cable free play:
2.0–3.0 mm (0.08–0.12 in)

4. Tighten the locknut.
5. Install the right side cover and the shroud.

ESU11861

Checking the throttle override system (T.O.R.S.)

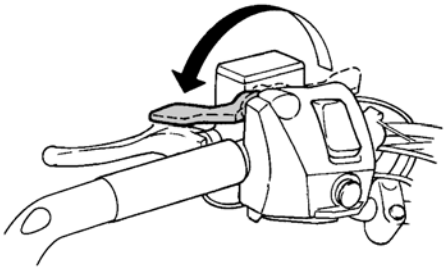
Check the T.O.R.S. for proper operation.

EWS00351

⚠ WARNING

When checking the T.O.R.S.:

- **Make sure that the parking brake is applied.**
- **Make sure that the throttle lever moves smoothly.**
- **Do not rev the engine to the point that the clutch engages, otherwise the snowmobile could start moving, which could cause an accident.**

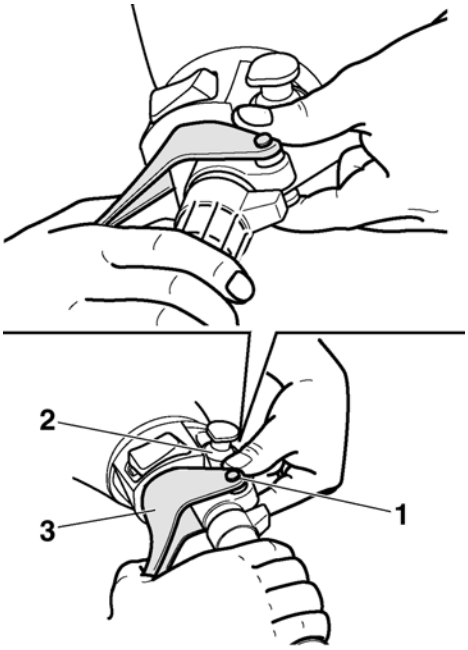


1. Start the engine.

NOTE:

Refer to the “Starting the engine” section on page 28.

2. Hold the pivot point of the throttle lever away from the throttle switch by putting your thumb (above) and forefinger (below) between the throttle lever pivot and the engine stop switch housing.
   While holding the pivot point as described above, press the throttle lever gradually.



1. Throttle lever pivot
2. Engine stop switch housing
3. Throttle lever

   The T.O.R.S. will be activated and the engine speed will be limited to less than the clutch engagement speed. (See page 74 for the clutch engagement speed.)

EWS00361

⚠ WARNING

If the engine speed does not decrease to less than the clutch engagement speed, stop the engine by turning the main switch to the off position and consult a Yamaha dealer.

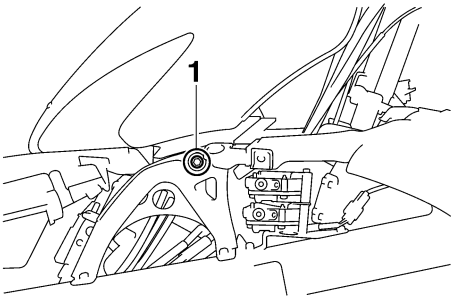
ESU12920

Checking the air filter

Always check that there is no snow under the air filter element frame.

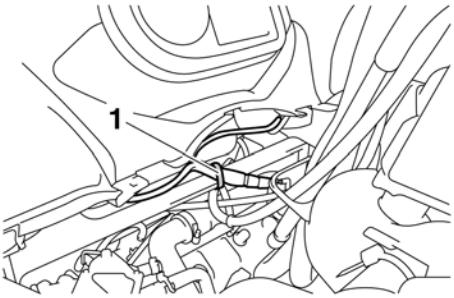
1. Remove the shroud, the left side cover, the right side cover, and the top cover. (See page 40 for removal procedures.)

2. Remove the headlight unit bolt on each side of the snowmobile.



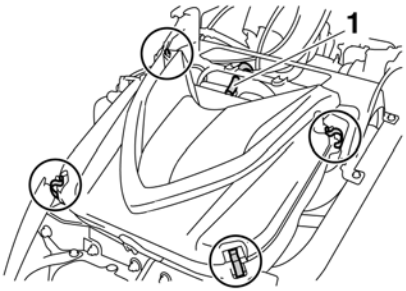
1. Headlight unit bolt

3. Unfasten the plastic band around the wire harness.



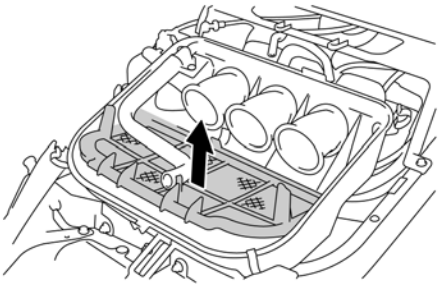
1. Plastic band

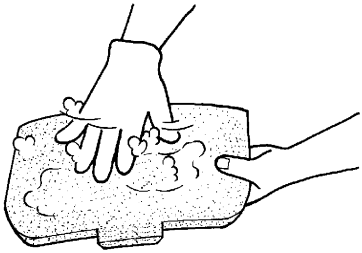
4. Disconnect the cylinder head breather hose.
5. Unhook the air filter case cover fasteners.



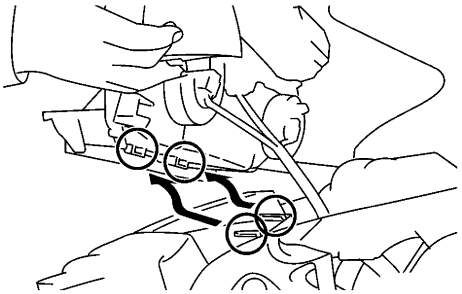
1. Cylinder head breather hose

6. Slightly lift up the headlight unit, and then remove the air filter case cover.
7. Lift up the air filter element frame and check the air filter element. If there is any snow on the air filter element, remove the element, brush off the snow, and then install the air filter element.





8. Place the air filter element frame in the original position, and then install the air filter case cover.
9. Hook the fasteners onto the air filter case cover.
10. Connect the cylinder head breather hose.
11. Install the headlight unit, making sure to insert the projections on the headlight unit stay into the slots on the bottom of the headlight unit.



12. Install the headlight unit bolts, and then tighten them to the specified torque.

Headlight unit bolt tightening torque: 3 Nm (0.3 m·kgf, 2.2 ft·lb)

13. Place the wire harness in the original position, and then fasten the plastic band around it.
14. Install the top cover, the right side cover, the left side cover, and the shroud.

NOTE:

After riding the snowmobile, make sure that there is no snow under the air filter element frame.

ESU11910

Carburetors

The carburetors are an important part of the engine and its emission control system, which require very sophisticated adjustment. Therefore, carburetor adjustments should be left to a Yamaha dealer, who has the necessary professional knowledge and experience.

ESU11940

High-altitude settings

Operating at high altitude reduces the performance of a gasoline engine about 3% for every 305 m (1000 ft) of elevation. This is because there is less air as altitude increases. Less air means less oxygen available for combustion.

Your snowmobile can be adjusted to overcome most of the problems found in high-altitude riding. Carburetor adjustments are the most important. Less air at high altitude makes the air/fuel ratio too rich, which can cause poor performance. Common problems are hard starting, bogging, and plug fouling. Proper carburetion adjustments will correct the air/fuel ratio. Be sure to have a Yamaha dealer make these adjustments.

Remember:

Less air at higher altitude means there is less horsepower available, even with proper carburetion. Expect acceleration and top speed to be reduced at higher altitudes.

To overcome operating with less power at high altitudes, your snowmobile may also require different settings for the drive chain gears and V-belt clutch to avoid poor performance and rapid wear. If you plan to operate your snowmobile at an altitude different from the area where you bought it, be sure to consult a Yamaha dealer. The dealer can tell you if there are any changes necessary for the altitude where you plan to ride.

ECS00430

CAUTION:

The drive chain gears and V-belt clutch should be adjusted when operating above a high altitude of 900 m (3000 ft). Consult a Yamaha dealer.

ESU11950

Valve clearance

The valve clearance changes with use, resulting in improper air-fuel mixture and/or engine noise. To prevent this from occurring, the valve clearance must be adjusted by a Yamaha dealer at the intervals specified in the periodic maintenance chart.

ESU12930
Engine oil and oil filter cartridge

The engine oil level should be checked before each use. In addition, the oil must be changed and the oil filter cartridge replaced at the intervals specified in the periodic maintenance and lubrication chart.

EWS00370
⚠ WARNING

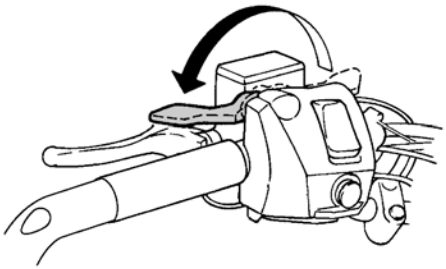
Engine oil is extremely hot immediately after the engine is turned off. Coming into contact with or getting any engine oil on your clothes could result in burns.

ECS00480
CAUTION:

- **Do not run the engine with too much or not enough oil in the oil tank. Oil could spray out or the engine could be damaged.**
- **Be sure to change the engine oil after the first 800 km (500 mi) of operation, and every 4000 km (2500 mi) thereafter or at the start of a new season, otherwise the engine will wear quickly.**
- **The oil filter cartridge should be replaced every 20000 km (12000 mi) of operation.**

To check the engine oil level

1. Place the snowmobile on a level surface and apply the parking brake.

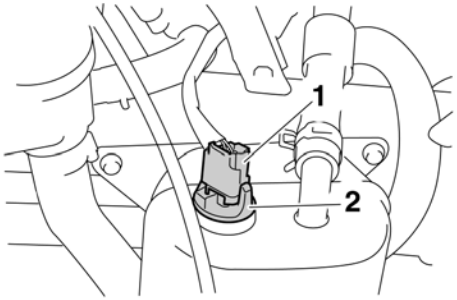


2. Start the engine, warm it up for 10–15 minutes, and then turn it off.

NOTE:

- The engine can also be warmed up by operating the snowmobile for 10–15 minutes.
- After operating the snowmobile, allow the engine to idle for at least 10 seconds before turning it off.

3. Remove the shroud and the right side cover. (See page 40 for removal procedures.)
4. Disconnect the oil level gauge coupler.

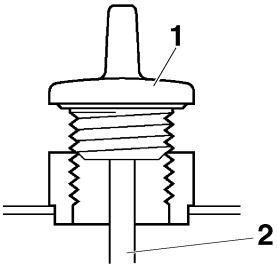


1. Oil level gauge coupler
2. Oil filler cap

ECS00451
CAUTION:

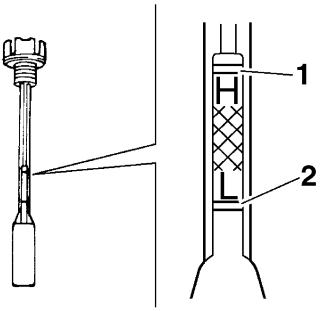
Disconnect the oil level gauge coupler before removing the oil filler cap, otherwise the cable could twist and break.

5. Remove the oil filler cap, wipe the dipstick clean, insert it back into the oil filler hole (without screwing it in), and then remove it again to check the oil level.



1. Oil filler cap
2. Dipstick

NOTE:
The engine oil should be between the "H" and "L" level marks on the dipstick.



1. "H" level mark
2. "L" level mark

6. If the engine oil is below the "L" level mark, add sufficient oil of the recommended type to raise it to the "H" level mark. (See page 74 for the recommended oil.)

ECS00461

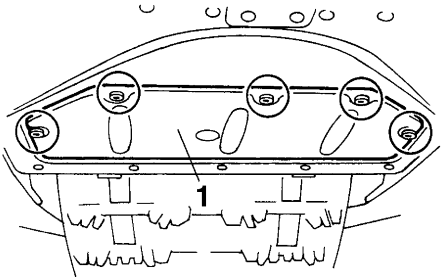
CAUTION:

- **When adding the engine oil, be careful not to fill above the "H" level mark on the dipstick.**
- **Use only 4-stroke engine oil.**
- **Make sure that no foreign material enters the engine oil tank.**

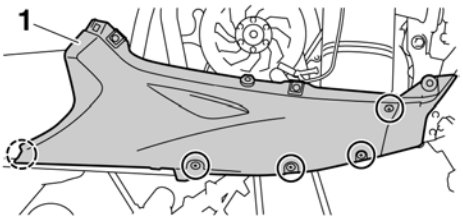
7. Insert the dipstick into the oil filler hole, and then tighten the oil filler cap.
8. Connect the oil level gauge coupler.
9. Install the right side cover and the shroud.

To change the engine oil (with or without oil filter cartridge replacement)

1. Place the snowmobile on a level surface and apply the parking brake.
2. Start the engine, warm it up for several minutes, and then turn it off.
3. Remove the shroud, the right side cover, and the top cover. (See page 40 for removal procedures.)
4. Remove the right lower cover and the bottom panel.

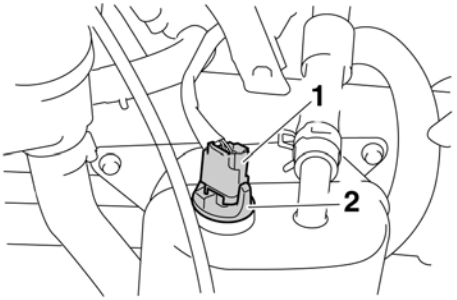


1. Bottom panel



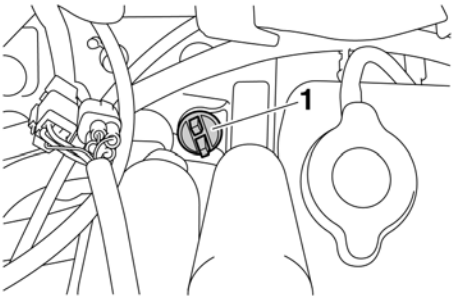
1. Right lower cover

5. Place an oil pan under the oil tank to collect the used oil.
6. Disconnect the oil level gauge coupler.

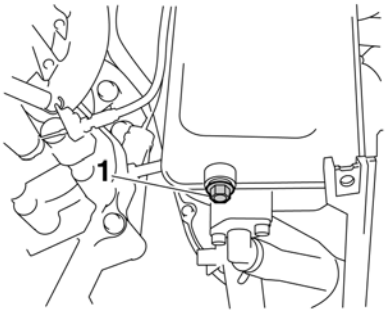


1. Oil level gauge coupler
2. Oil filler cap

7. Remove the oil filler cap, the cylinder head cap, and the engine oil drain bolt to drain the oil from the oil tank.

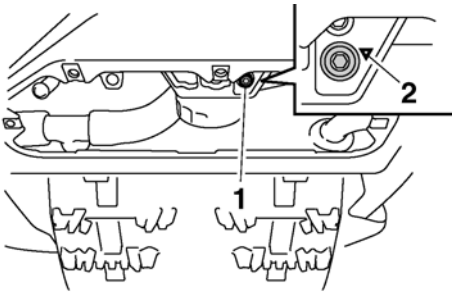


1. Cylinder head cap



1. Engine oil drain bolt (oil tank)

8. Place an oil pan under the engine to collect the used oil.
9. Remove the engine oil drain bolt to drain the oil from the crankcase.

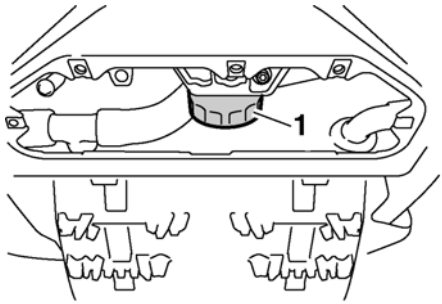


1. Engine oil drain bolt (crankcase)
2. " ▽ " mark

NOTE:

- A " ▽ " mark is stamped on the crankcase near the engine oil drain bolt.
- Dispose of used oil according to local regulations.
- Skip steps 10–12 if the oil filter cartridge is not being replaced.

10. Remove the oil filter cartridge with an oil filter wrench.



1. Oil filter cartridge

NOTE:

An oil filter wrench is available at a Yamaha dealer.

11. Apply a thin coat of engine oil to the O-ring of the new oil filter cartridge.
12. Install the new oil filter cartridge with an oil filter wrench, and then tighten it to the specified torque.

Tightening torque:
Oil filter cartridge:
17 Nm (1.7 m·kgf, 12 ft·lb)

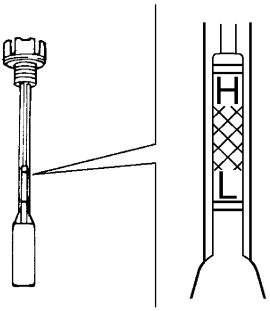
13. Install the engine oil drain bolts, and then tighten them to the specified torques.

Tightening torques:
Engine oil drain bolt (crankcase):
10 Nm (1.0 m·kgf, 7.2 ft·lb)
Engine oil drain bolt (oil tank):
16 Nm (1.6 m·kgf, 11 ft·lb)

14. Add 1.5 L (1.6 US qt) (1.3 Imp. qt) of the recommended engine oil to the oil tank, and then install and tighten the oil filler cap and the cylinder head cap.

Recommended engine oil:
See page 74.
Oil quantity:
With oil filter cartridge replacement:
2.5 L (2.64 US qt) (2.20 Imp.qt)
Without oil filter cartridge replacement:
2.3 L (2.43 US qt) (2.02 Imp.qt)
Total amount:
3.2 L (3.38 US qt) (2.82 Imp.qt)

15. Start the engine, warm it up for several minutes, and then turn it off.
16. Add sufficient oil of the recommended type to raise it to the "H" level mark on the dipstick. (See above for the checking procedure.)



ECS00461

CAUTION:

- **When adding the engine oil, be careful not to fill above the "H" level mark on the dipstick.**
- **Use only 4-stroke engine oil.**
- **Make sure that no foreign material enters the engine oil tank.**

17. Start the engine, and then let it idle for several minutes while checking it for oil leakage. If oil is leaking, immediately turn the engine off and make sure that the engine oil drain bolts, the cylinder head cap, and the oil filler cap are installed correctly.
18. Turn the engine off, and then connect the oil level gauge coupler.

ECS00470

CAUTION:

If oil is leaking or the oil level warning indicator comes on when the engine is running, immediately turn the engine off and have a Yamaha dealer check the snowmobile. Continuing to operate the engine under such conditions could cause severe engine damage.

19. Install the bottom panel and the right lower cover.
20. Install the top cover, the right side cover, and the shroud.

ESU12940

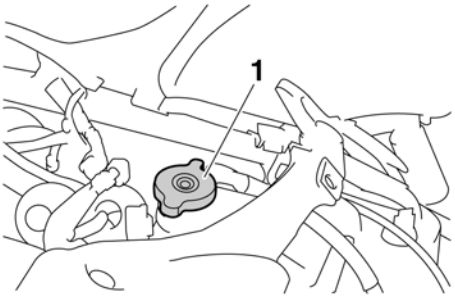
Cooling system

The coolant level should be checked before each ride. In addition, the cooling system must be bled of air at the intervals specified in the periodic maintenance and lubrication chart.

EWS00380

⚠ WARNING

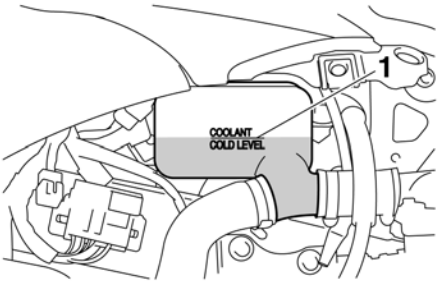
Do not remove the coolant reservoir cap when the engine is hot. Scalding hot fluid and steam may be blown out under pressure, which could cause serious injury.
When the engine has cooled, place a thick rag or towel over the coolant reservoir cap, and slowly rotate the cap counterclockwise to the detent. This procedure allows any residual pressure to escape. When the hissing sound has stopped, press down on the cap while turning counterclockwise and remove it.



1. Coolant reservoir cap

To check the coolant level

1. Remove the shroud and the right side cover. (See page 40 for removal procedures.)
2. Check the coolant level in the coolant reservoir when the engine is cold. If the coolant level is below the "COLD LEVEL" mark, add coolant until it reaches the "COLD LEVEL" mark. (See the following section "Replenishing the coolant" for more details.)



1. "COLD LEVEL" mark

ECS00490

CAUTION:

- **Hard water or salt water is harmful to the engine parts. You may use boiled or distilled water, if soft water is not available.**
- **Tap water can be used temporarily in an emergency.**

3. Install the right side cover and the shroud.

Bleeding the cooling system

The cooling system must be bled of air if the coolant reservoir becomes empty, if air can be seen in the cooling system, or if there is a cooling system leak. Consult a Yamaha dealer.

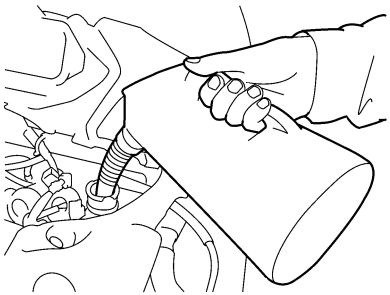
ECS00500

CAUTION:

Operating the engine with an improperly bled cooling system can cause overheating and severe engine damage.

Replenishing the coolant

1. Remove the shroud, the right side cover, and the top cover. (See page 40 for removal procedures.)
2. Remove the coolant reservoir cap and add coolant until it reaches the "COLD LEVEL" mark.



Recommended antifreeze:
High-quality ethylene glycol antifreeze containing corrosion inhibitors
Antifreeze and water mixing ratio:
3:2
Total amount:
RS90GT 4.80 L (5.07 US qt) (4.22 Imp.qt)
RS90GTA 4.80 L (5.07 US qt) (4.22 Imp.qt)
RS90LT 5.60 L (5.92 US qt) (4.93 Imp.qt)
RS90LTGT 5.60 L (5.92 US qt) (4.93 Imp.qt)
RS90R 4.80 L (5.07 US qt) (4.22 Imp.qt)

3. Start the engine and add coolant until the coolant level stabilizes, and then stop the engine.
4. Fill the coolant reservoir with coolant until it reaches the “COLD LEVEL” mark.
5. Install the coolant reservoir cap.
6. Check for any coolant leakage.

NOTE:
If you find any leaks, consult a Yamaha dealer.

7. Install the top cover, the right side cover, and the shroud.

ESU12060

V-belt

EWS00400

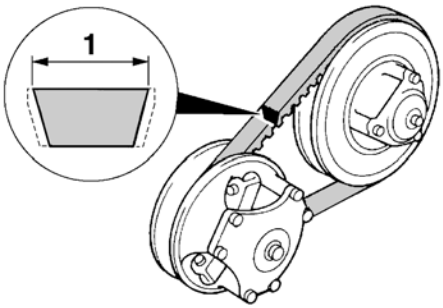
⚠ WARNING

- **Make sure that the drive guard is tightened securely before operating the snowmobile.**
- **Never run the engine with the V-belt or drive guard removed.**

The V-belt should be checked before each ride.

To check the V-belt

1. Remove the shroud and the left side cover, and then remove the drive guard. (See page 40 for removal procedures.)
2. Check the V-belt for wear and damage. Replace if necessary.



1. V-belt wear limit

New V-belt width:
34.1 mm (1.34 in)
V-belt wear limit width:
32.5 mm (1.28 in)

3. Install the drive guard, and then install the left side cover and the shroud.

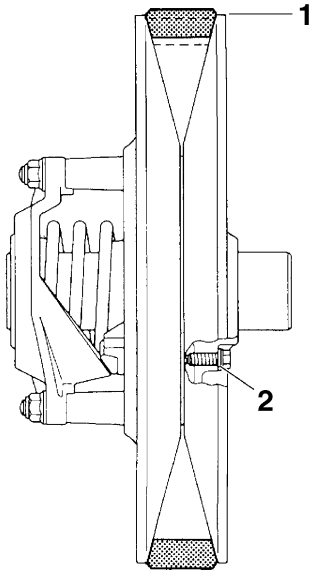
To replace and adjust the V-belt

EWS00410

⚠ WARNING

- **Never run the engine with the V-belt or drive guard removed.**

- **When installing the new V-belt, make sure that it is positioned properly. Otherwise, the V-belt clutch engagement speed will be changed and the snowmobile may move unexpectedly when the engine is started, which could cause an accident.**
- **Have a Yamaha dealer make this adjustment.**



1. Edge of the secondary sheave assembly
2. Spacer

ECS00510

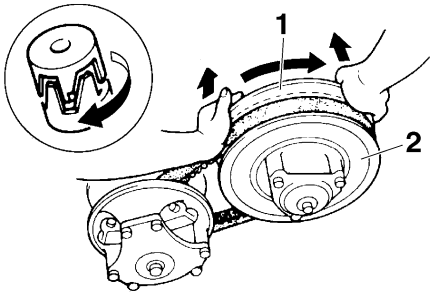
CAUTION:

As the V-belt wears, adjustment may be necessary. To ensure proper clutch performance, the V-belt position should be adjusted by adding a spacer on each adjusting bolt when the V-belt position reaches 1.5 mm (0.06 in) below the edge of the secondary sheave assembly. Have a Yamaha dealer make this adjustment.

NOTE:

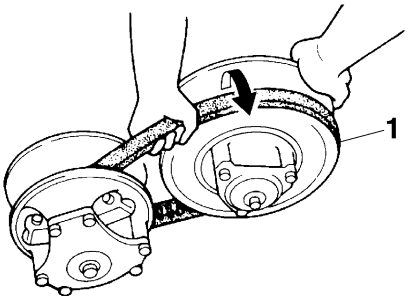
Apply the parking brake before replacing the V-belt.

1. Remove the shroud and the left side cover, and then remove the drive guard. (See page 40 for removal procedures.)
2. Rotate the secondary sliding sheave clockwise and push it so that it separates from the secondary fixed sheave.



1. Secondary sliding sheave
2. Secondary fixed sheave

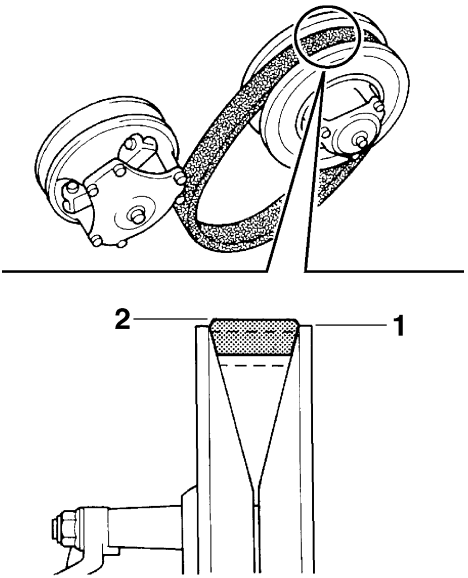
3. Pull the V-belt up over the secondary fixed sheave.



1. V-belt

4. Remove the V-belt from the secondary sheave assembly and primary sheave assembly.

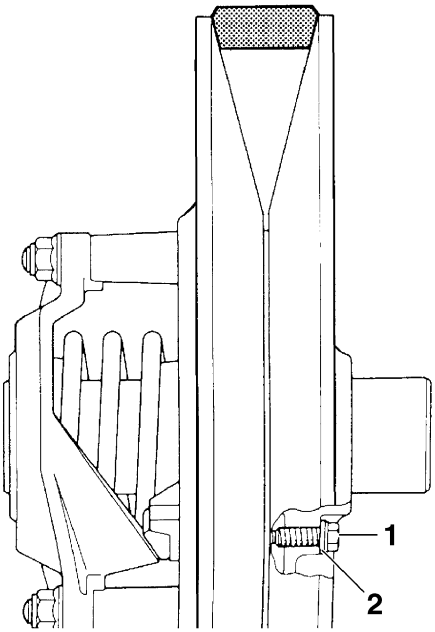
5. Temporarily install the new V-belt on the secondary sheave assembly only, and then measure the V-belt position. Do not force the V-belt between the sheaves; the secondary sliding and fixed sheaves must touch each other.



1. Edge of the secondary sheave assembly
2. V-belt position

Standard V-belt position:
From 1.5 mm (0.06 in) above the edge of the secondary sheave assembly to 0.5 mm (0.02 in) below the edge.

6. If the V-belt position is incorrect, adjust it by removing or adding a spacer on each V-belt position adjusting bolt.



1. V-belt position adjusting bolt
2. Spacer

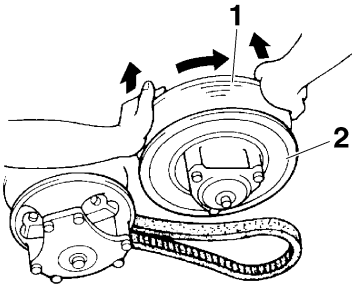
V-belt position	Adjustment
More than 1.5 mm (0.06 in) above the edge	Remove spacer
From 1.5 mm (0.06 in) above the edge to 0.5 mm (0.02 in) below the edge	Not necessary (It is correct.)
More than 0.5 mm (0.02 in) below the edge	Add spacer

7. Tighten the V-belt position adjusting bolts.

V-belt position adjusting bolt tightening torque:
10 Nm (1.0 m·kgf, 7.2 ft·lb)

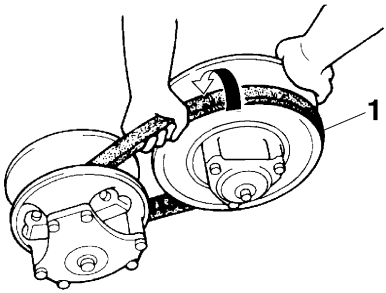
8. Install the V-belt over the primary sheave assembly.

9. Rotate the secondary sliding sheave clockwise and push it so that it separates from the secondary fixed sheave.



1. Secondary sliding sheave
2. Secondary fixed sheave

10. Install the V-belt between the secondary sliding and fixed sheaves.



1. V-belt

11. Install the drive guard, and then install the left side cover and the shroud.

ESU12100

Drive chain housing

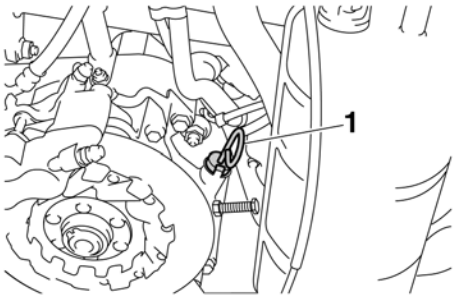
EWS00430

⚠ WARNING

The engine, oil tank, brake disc, and coolant hoses will be very hot after the engine has been run. Avoid contact while they are still hot with any part of your body or clothing during inspection or repair.

To check the drive chain housing oil level

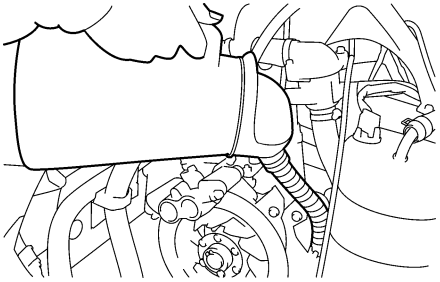
1. Place the snowmobile on a level surface.
2. Remove the shroud and the right side cover. (See page 40 for removal procedures.)
3. Remove the dipstick, wipe it off with a clean rag, and then insert it back into the filler hole.



1. Dipstick

4. Remove the dipstick and check that the oil is between the maximum and minimum level marks. If the oil is below the minimum level mark, add sufficient oil of the recommended type to raise it to the maximum level mark.

1. Maximum level mark
2. Minimum level mark



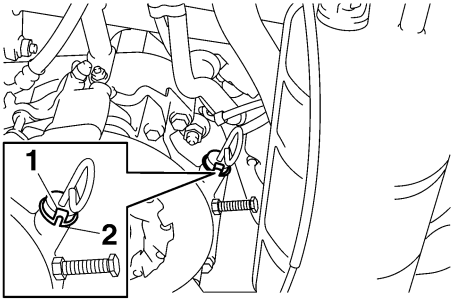
Recommended drive chain oil:
SAE 75W or 80W API GL-4 Gear oil

ECS00530

CAUTION:

Make sure that no foreign material enters the drive chain housing.

5. Install the dipstick, making sure to align the notch in the dipstick handle with the projection on the drive chain housing.

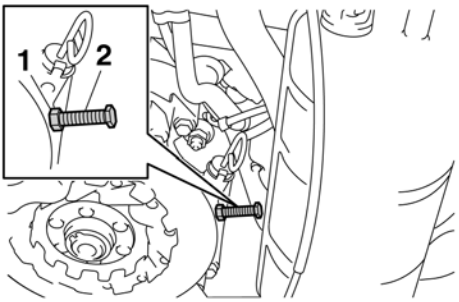


1. Notch
2. Projection

6. Install the right side cover and the shroud.

To adjust the chain tension

1. Remove the shroud and the right side cover. (See page 40 for removal procedures.)
2. Loosen the locknut.
3. Turn the chain tension adjusting bolt clockwise until it is finger tight, and then loosen it 1/4 turn.
4. Hold the chain tension adjusting bolt in place while tightening the locknut.



1. Locknut
2. Chain tension adjusting bolt

5. Install the right side cover and the shroud.

ESU12130

Brake and parking brake

EWS00440

⚠ WARNING

- **A soft, spongy feeling in the brake lever indicates a failure in the brake system.**
- **Do not operate the snowmobile if you find any problems in the brake system. You could lose braking ability, which could lead to an accident. Ask a Yamaha dealer to inspect and repair the brake system.**

ECS00060

CAUTION:

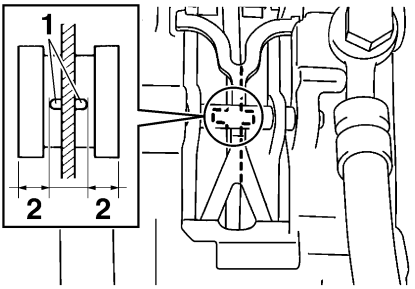
Make sure that the brake lever end does not project out over the handlebar end. This will help prevent brake lever damage when the snowmobile is placed on its side for service.

Test the brake at a low speed when starting out to make sure that it is working properly. If the brake does not provide proper braking performance, inspect the brake for wear or brake fluid leakage. (See the following section for more details.)

Checking the brake pads

Check the brake pads for wear.

If the brake pads reach the wear limit, ask a Yamaha dealer to replace them.

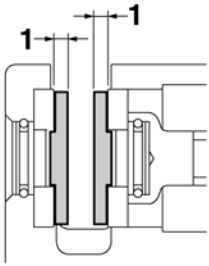


1. Brake pad wear indicator
2. Brake pad wear limit

Brake pad wear limit:
7.5 mm (0.30 in)

Checking the parking brake pads

Check the parking brake pads for wear by measuring the thickness of the pads. If the parking brake pads reach the wear limit, ask a Yamaha dealer to replace them.



1. Parking brake pad wear limit

Parking brake pad wear limit:
1.2 mm (0.047 in)

To adjust the parking brake

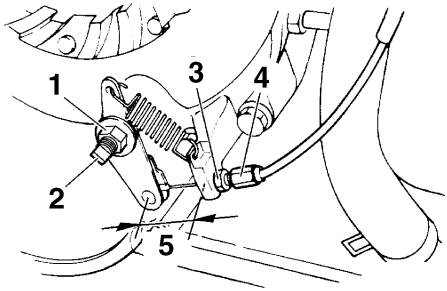
As the parking brake pads wear, adjustment may be necessary to ensure proper brake performance.

EWS00450

⚠ WARNING

Be sure to have a Yamaha dealer make this adjustment.

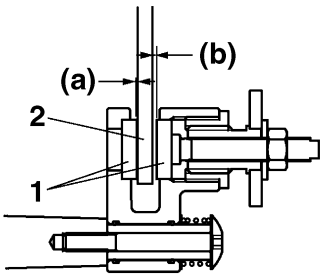
1. Loosen the parking brake pad locknut and the parking brake pad adjusting bolt.
2. Loosen the parking brake cable locknut.
3. Turn the parking brake cable adjusting bolt in or out to adjust the cable length.



1. Parking brake pad locknut
2. Parking brake pad adjusting bolt
3. Parking brake cable locknut
4. Parking brake cable adjusting bolt
5. Parking brake cable length

Parking brake cable length:
43.5–46.5 mm (1.713–1.831 in)

4. Tighten the parking brake cable locknut.
5. Turn the parking brake pad adjusting bolt in or out to adjust the clearance between the parking brake pads and the brake disc.



1. Parking brake pad
2. Brake disc

Parking brake pad to brake disc clearance (a) + (b):
1.5–2.0 mm (0.059–0.079 in)

6. Tighten the parking brake pad locknut.

Checking the brake fluid level

EWS00460

WARNING

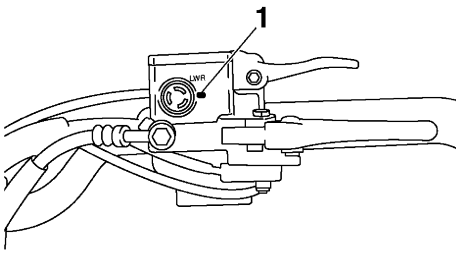
Be careful that water does not enter the master cylinder when refilling. Water will significantly lower the boiling point of the fluid and may result in vapor lock.
If the brake fluid level goes down, consult a Yamaha dealer.

ECS00550

CAUTION:

Brake fluid may deteriorate painted surfaces or plastic parts. Never spill any fluid. If any is spilled, clean it up immediately.

Place the snowmobile on a level surface. Check that the brake fluid is above the lower level and replenish when necessary.



1. Lower level

Specified brake fluid:
DOT 4

Changing the brake fluid

EWS00470

WARNING

Make sure that the brake fluid and the above parts are replaced by a Yamaha dealer.

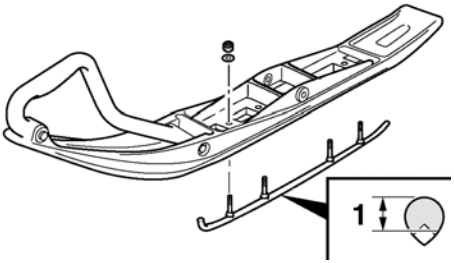
Brake fluid replacement is necessary when the following components are replaced during the periodic maintenance or if they are damaged or leaking.

- All oil seals of the master cylinder and caliper cylinder
- The brake hose

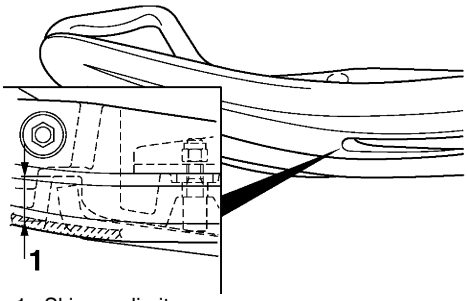
ESU12141

Skis and ski runners

Check the skis and ski runners for wear and damage. Replace if necessary.



1. Ski runner wear limit



1. Ski wear limit

Ski runner wear limit:
8 mm (0.31 in)
Ski wear limit:
12 mm (0.47 in)

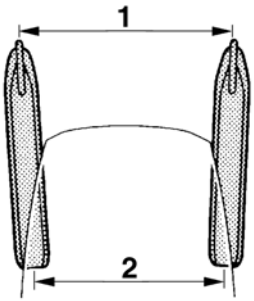
ECS00560

CAUTION:

Avoid scratching the skis when loading and unloading the snowmobile, when riding in areas with little or no snow, or on sharp edges such as concrete, curbs, etc. This will wear or damage the skis.

To align the skis

1. Turn the handlebar so the skis face straight ahead.
2. Check the following for ski alignment:
   - Skis are facing forward.
   - Ski toe-out (distance A – distance B) is within specification.



1. Distance A
2. Distance B

Ski toe-out (distance A – distance B):
0.0–15.0 mm (0.00–0.59 in)

3. If the alignment is not correct, consult a Yamaha dealer.

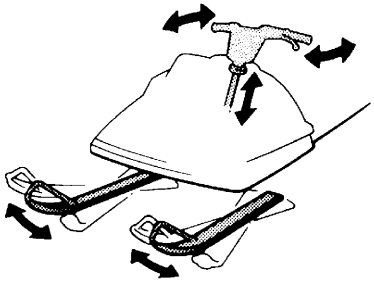
ESU12151

Steering system

Check the handlebar for excessive free play.

To check the handlebar

1. Push the handlebar up and down and back and forth.
2. Turn the handlebar slightly to the right and left.



If excessive free play is felt, consult a Yamaha dealer.

ESU12171

Drive track and slide runners

Drive track

EWS00480

⚠ WARNING

A broken track, track fittings or debris thrown by the drive track could be dangerous to an operator or bystanders. Observe the following precautions:

- **Do not allow anyone to stand behind the snowmobile when the engine is running.**
- **When the rear of the snowmobile is raised to allow the drive track to spin, a suitable stand must be used to support the rear of the snowmobile. Never allow anyone to hold the rear of the snowmobile off the ground to allow the drive track to spin. Never allow anyone near a rotating drive track.**
- **Inspect the drive track condition frequently. Replace damaged slide metal. Replace the drive track if it is damaged to the depth where fabric reinforcement material is visible or support rods are broken. Otherwise, track damage or failure could result in loss of braking ability and snowmobile control, which could cause an accident.**

Checking the drive track

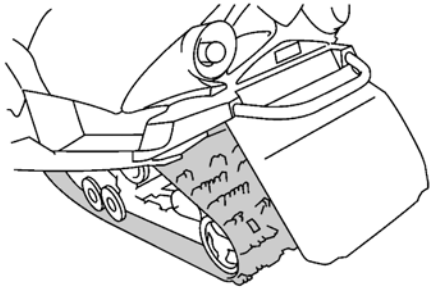
EWS00490

⚠ WARNING

Do not operate the snowmobile if you find damage to the drive track, or if it has been maladjusted. Drive track damage or failure could result in loss of braking ability and snowmobile control, which could cause an accident.

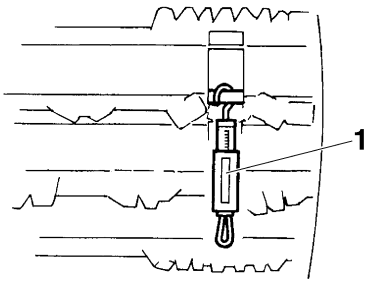
Check the drive track for deflection, wear, and damage.

Adjust or replace if necessary. (See the following section for more details.)



Measuring the drive track deflection

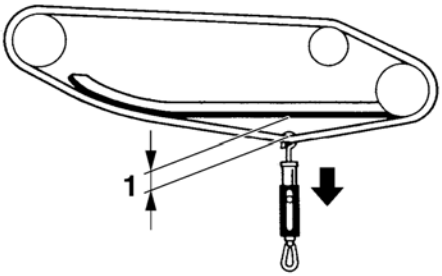
1. Lay the snowmobile on its side.
2. Measure the drive track deflection with a spring scale. Pull at the center of the drive track with a force of 100 N (10 kg, 22 lb).



1. Spring scale

NOTE:

Measure the gap between the slide runner and the edge of the track window. Measure both sides.



1. Drive track deflection

Standard drive track deflection:
RS90GT 30.0–35.0 mm (1.18–1.38 in)
RS90GTA 30.0–35.0 mm (1.18–1.38 in)
RS90LT 25.0–30.0 mm (0.98–1.18 in)
RS90LTGT 25.0–30.0 mm (0.98–1.18 in)
RS90R 30.0–35.0 mm (1.18–1.38 in)

3. If the deflection is incorrect, adjust the drive track.

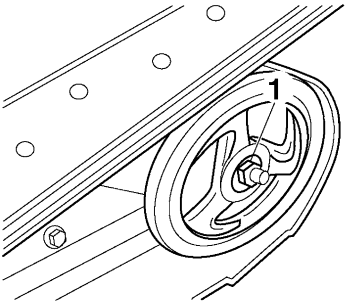
Adjusting the drive track

EWS00500

⚠ WARNING

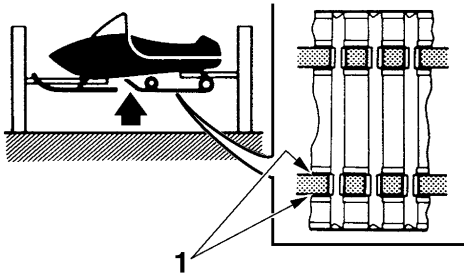
- **Be sure to have a Yamaha dealer make this adjustment.**
- **Support the snowmobile securely on a suitable stand before working underneath the snowmobile.**
- **Operate the engine in a well-ventilated area.**

1. Lift the rear of the snowmobile onto a suitable stand to raise the drive track off the ground.
2. Loosen the rear axle nut.



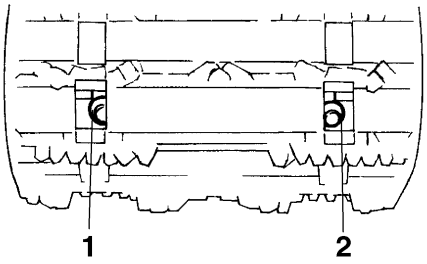
1. Rear axle nut

3. Start the engine and rotate the drive track one or two turns. Stop the engine.
4. Check the drive track alignment with the slide runners. If the alignment is incorrect, align the drive track by turning the left and right adjusting nuts.



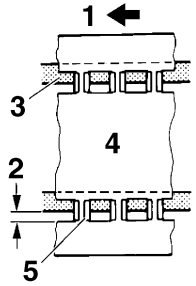
1. Slide runner

Drive track alignment	Shifted to right	Shifted to left
Left adjusting nut	Turn out	Turn in
Right adjusting nut	Turn in	Turn out



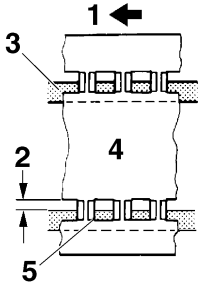
1. Left adjusting nut
2. Right adjusting nut

Shifted to right



1. Forward
2. Gap
3. Slide runner
4. Drive track
5. Slide metal

Shifted to left



1. Forward
2. Gap
3. Slide runner
4. Drive track
5. Slide metal

5. Adjust the drive track deflection to specification.

Drive track deflection	More than specified	Less than specified
Left adjusting nut	Turn in	Turn out
Right adjusting nut	Turn in	Turn out

ECS00591

CAUTION:

The right and left adjusting nuts should be turned an equal amount.

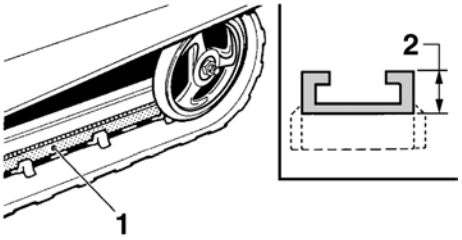
6. Recheck alignment and deflection. If necessary, repeat steps 3 to 5 until the proper adjustment is achieved.
7. Tighten the rear axle nut.

Rear axle nut tightening torque:
75 Nm (7.5 m·kgf, 54 ft·lb)

Slide runners

Check the slide runners for wear and damage.

If the slide runners reach the wear limit, they should be replaced.



1. Slide runner
2. Wear limit height

Slide runner wear limit height:
10.5 mm (0.41 in)

ECS00350

CAUTION:

Ride on fresh snow frequently. Operating on ice or hard-packed snow will rapidly wear the slide runners.

ESU12190

Lubrication

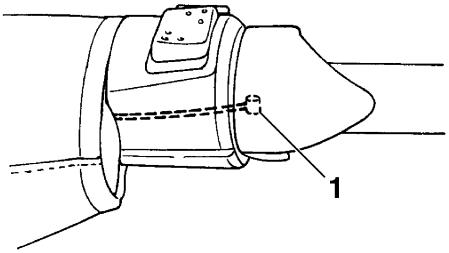
Lubricate the following points with the specified grease.

EWS00510

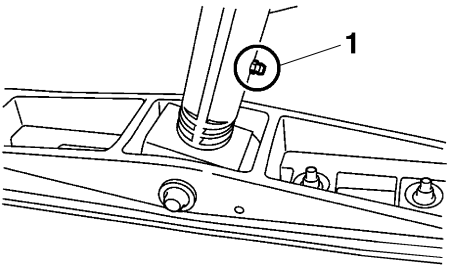
⚠ WARNING

- **Apply a dab of grease onto the cable end only. Do not grease the throttle cable because it could become frozen, which could cause loss of control.**
- **Be sure to have a Yamaha dealer lubricate the front and rear suspensions.**

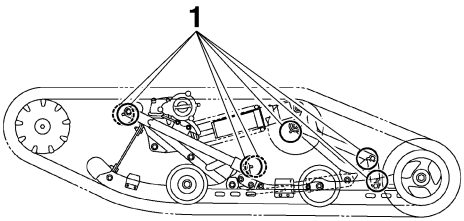
Lubricant:
Low-temperature grease



1. Throttle cable end



1. Lubrication point



1. Lubrication point

ESU12220

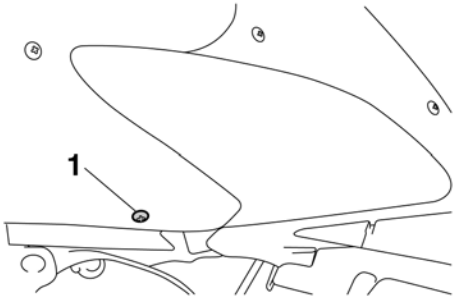
Replacing a headlight bulb

EWS00530

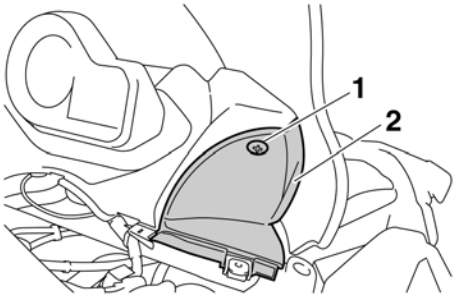
⚠ WARNING

Keep flammable products and your hands away from the hot bulb until it has cooled down.

1. Remove the top cover. (See page 40 for removal procedures.)
2. Remove the screws, and then remove the headlight access panel.

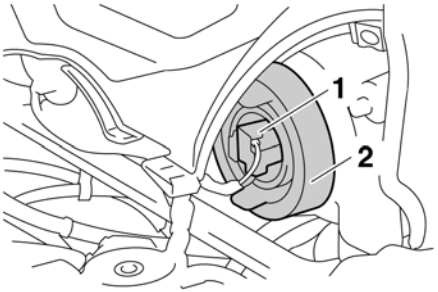


1. Screw



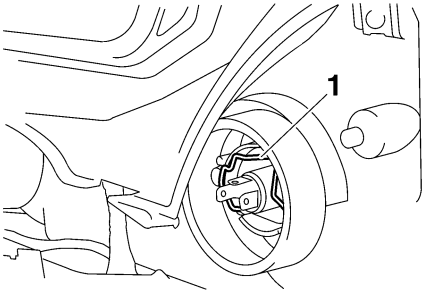
1. Screw
2. Headlight access panel

3. Disconnect the headlight coupler.
4. Remove the bulb holder cover.



1. Headlight coupler
2. Bulb holder cover

5. Unhook the bulb holder by pushing it in, then clockwise.



1. Bulb holder

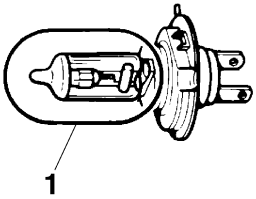
6. Remove the bulb.
7. Install the new bulb, and then hook the bulb holder onto the headlight unit.

Bulb type:
Halogen bulb

ECS00620

CAUTION:

Keep oil and your hands away from the glass part of the bulb or its life and illumination will be affected.
If the glass is oil stained, thoroughly clean it with a cloth moistened with alcohol or lacquer thinner.



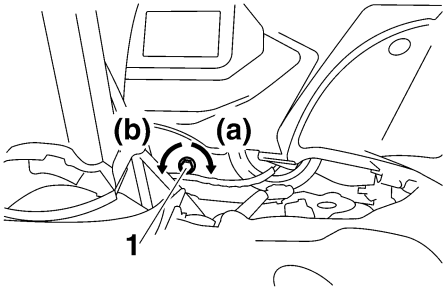
1. Do not touch the glass part of the bulb.

8. Install the bulb holder cover, and then connect the headlight coupler.
9. Install the headlight access panel and the top cover.

ESU12270

Adjusting the headlight beams

1. Remove the top cover. (See page 40 for removal procedures.)
2. Use a Phillips screwdriver to turn the headlight beam adjusting screw and adjust the headlight beams. To lower the headlight beams, turn the headlight beam adjusting screw in direction (a). To raise the headlight beams, turn the headlight beam adjusting screw in direction (b).



1. Headlight beam adjusting screw

3. Install the top cover.

ESU12290

Fittings and fasteners

Check the tightness of the fittings and fasteners.

Tighten in proper sequence and torque if necessary.

ESU12300

Battery

This snowmobile is equipped with a sealed-type (MF) battery, which does not require any maintenance. There is no need to check the electrolyte or to add distilled water.

To charge the battery

Have a Yamaha dealer charge the battery as soon as possible if it seems to have discharged. Keep in mind that the battery tends to discharge more quickly if the snowmobile is equipped with electrical accessories.

EWS00540

⚠ WARNING

Battery electrolyte is poisonous and dangerous. It contains sulfuric acid and can cause severe burns. Avoid contact with skin, eyes, or clothing.
ANTIDOTE:
- **EXTERNAL: Flush with water.**
- **INTERNAL: Drink large quantities of water or milk. Follow with milk of magnesia, beaten egg, or vegetable oil. Call physician immediately.**
- **EYES: Flush with water for 15 minutes and get prompt medical attention.**

Batteries produce explosive gases. Keep sparks, flame, cigarettes, etc. away. Ventilate when charging or using in an enclosed space. Always shield your eyes when working near batteries.
KEEP OUT OF THE REACH OF CHILDREN.

ESU12950

Replacing a fuse

EWS00550

⚠ WARNING

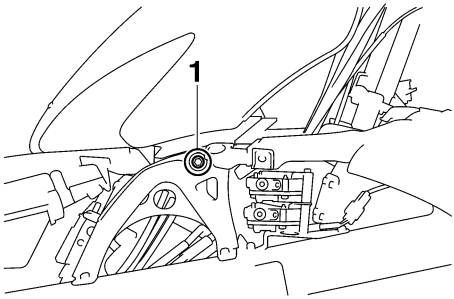
Be sure to use the specified fuse. A wrong fuse could cause electrical system damage or A FIRE HAZARD.

ECS00631

CAUTION:

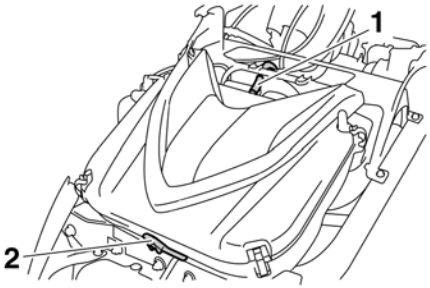
Be sure to turn the main switch to the off position and disconnect the negative battery lead to prevent accidental short-circuiting.

1. Remove the shroud, the left side cover, the right side cover, and the top cover. (See page 40 for removal procedures.)
2. Remove the headlight unit bolt on each side of the snowmobile, disconnect the headlight couplers and speedometer coupler, and then remove the headlight unit.



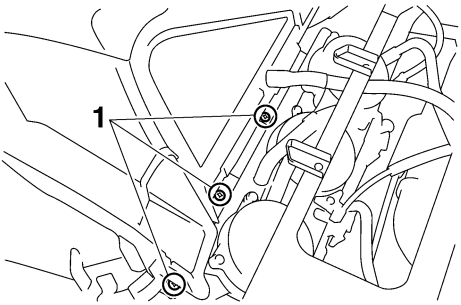
1. Headlight unit bolt

3. Disconnect the cylinder head breather hose and unhook the air filter case fastener.



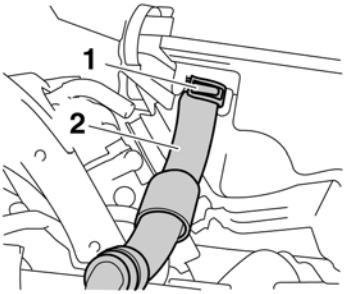
1. Cylinder head breather hose
2. Fastener

4. Loosen the joint clamp bolts.



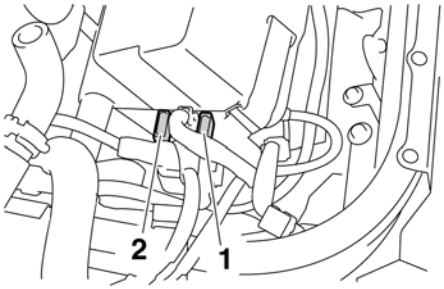
1. Joint clamp bolt

5. Lift up the air filter case, slide the oil tank breather hose clamp down, disconnect the oil tank breather hose from the air filter case, and then remove the air filter case.

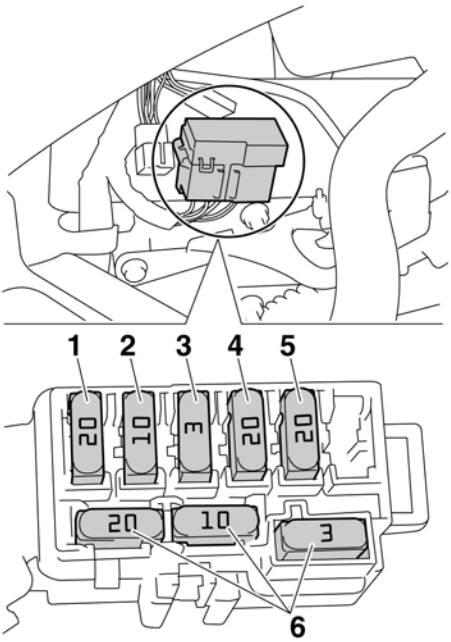


1. Oil tank breather hose clamp
2. Oil tank breather hose

6. Disconnect the negative battery lead.
7. Replace the blown fuse with one of the proper amperage.



1. Main fuse
2. Spare main fuse



1. "HEAD" (headlight) fuse
2. "SIG" (signal) fuse
3. "DC TERM" (auxiliary DC jack) fuse
4. "C/W" (carburetor warmer) fuse
5. "IGN" (ignition) fuse
6. Spare fuse

Specified fuses:
- Main fuse:
  - 30.0 A
- Spare main fuse:
  - 30.0 A
- "HEAD" (headlight) fuse:
  - 20.0 A
- "SIG" (signal) fuse:
  - 10.0 A
- "DC TERM" (auxiliary DC jack) fuse:
  - 3.0 A
- "C/W" (carburetor warmer) fuse:
  - 20.0 A
- "IGN" (ignition) fuse:
  - 20.0 A
- Spare fuses:
  - 20.0 A, 10.0 A, 3.0 A

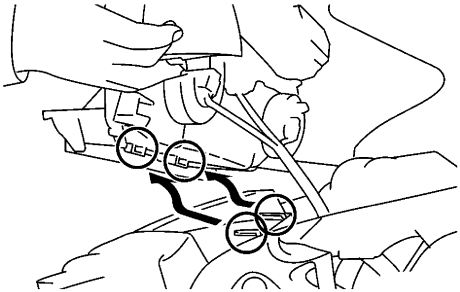
8. Connect the negative battery lead.
9. Install the air filter case by reversing the removal steps.

ECS00640

CAUTION:

Be sure to connect the breather hoses securely when installing the air filter case.

10. Connect the headlight couplers and speedometer coupler, and then install the headlight unit, making sure to insert the projections on the headlight unit stay into the slots on the bottom of the headlight unit.



11. Install the headlight unit bolts, and then tighten them to the specified torque.

Headlight unit bolt tightening torque:
3 Nm (0.3 m·kgf, 2.2 ft·lb)

12. Install the top cover, the right side cover, the left side cover, and the shroud.

NOTE:

If the fuse immediately blows again, ask a Yamaha dealer to inspect the snowmobile.

ESU12960

Engine turns over but does not start

1. Fuel system
   No fuel supplied to combustion chamber
   - No fuel in tank: Supply fuel.
   - Clogged fuel line: Clean fuel line.
   - Clogged carburetor: Clean carburetor.

   Fuel supplied to combustion chamber
   - Flooded engine (too much choke): Crank engine with throttle open or wipe the spark plugs dry.
2. Electrical system
   Poor spark or no spark
   - Spark plugs are dirty with carbon or are wet: Remove carbon or wipe the spark plugs dry. Replace if necessary.
   - Faulty ignition system: Ask a Yamaha dealer to inspect.
   - T.O.R.S. malfunction: Disconnect the throttle switch connectors and connect the wire harness connectors together to bypass the T.O.R.S.

EWS00560

⚠ WARNING

- **Before bypassing the T.O.R.S., make sure that the throttle returns properly to the fully closed position.**
- **The T.O.R.S. is an important safety device; in the case of a malfunction, take the snowmobile to a Yamaha dealer immediately for repair.**

3. Compression
   Insufficient
   - Loose cylinder head nuts: Tighten nuts properly.
   - Worn or damaged gasket: Replace gasket.
   - Worn or damaged piston and cylinder: Ask a Yamaha dealer to inspect.

Discharged battery

If the battery is discharged, the engine can be started using a fully-charged 12-volt battery and jumper cables. Two connecting leads have been provided for jump-starting the snowmobile. Due to the rubber engine mounting, the snowmobile frame is not a suitable grounding point for jump-starting the engine.

EWS00570

⚠ WARNING

- **Connect the jumper cables only to the connecting lead terminals. Do not connect them to the frame or any wire or other lead.**
- **When connecting the jumper cables, do not contact the jumper cables or connecting lead terminals to each other or to the frame or any metal part of the snowmobile. This can cause electrical system damage or A FIRE HAZARD.**
- **Be sure to pull the lead covers back over the terminals completely. If the terminals are exposed, they could come into contact with the frame or a metal part of the snowmobile and this can cause electrical system damage or A FIRE HAZARD.**

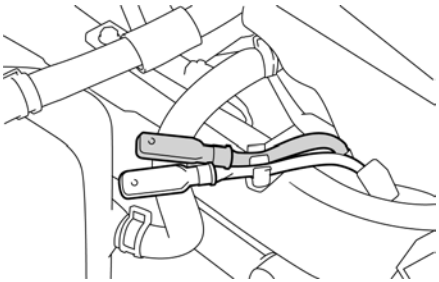
ECS00650

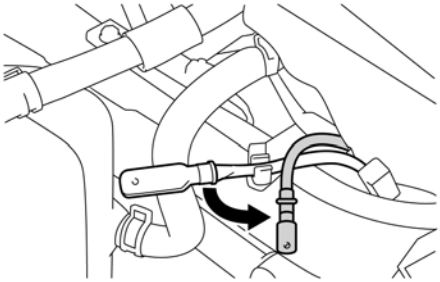
CAUTION:

Use the connecting leads to jump-start the snowmobile only. Do not use the connecting leads for any other purpose.

To start the engine using the booster battery

1. Apply the parking brake and turn the main switch to the off position.
2. Remove the shroud and the right side cover. (See page 40 for removal procedures.)
3. Remove the red (+) connecting lead from the lead holder and move it away from the black (–) connecting lead.



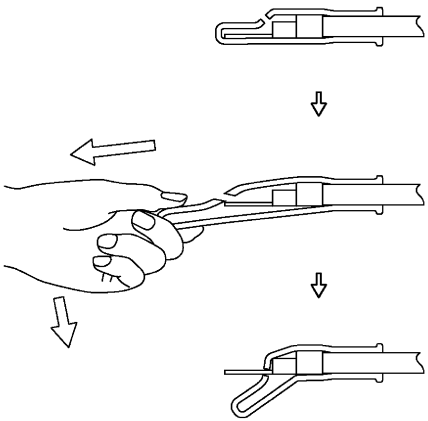


ECS00660

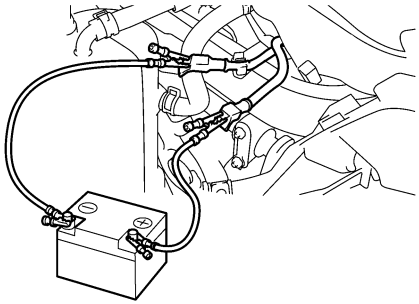
CAUTION:

Be sure to connect the red (+) jumper cable to the red (+) connecting lead and the black (–) jumper cable to the black (–) connecting lead. Do not reverse the connections.

4. Pull the red (+) connecting lead cover to expose the terminal through the slit in the cover, and then connect the red (+) jumper cable to the red (+) connecting lead.



5. Connect the other end of the red (+) jumper cable to the positive (+) terminal of the booster battery.
6. Connect the black (–) jumper cable to the negative (–) terminal of the booster battery.
7. Pull the black (–) connecting lead cover to expose the terminal through the slit in the cover, and then connect the black (–) jumper cable to the black (–) connecting lead.



8. Start the engine.
9. Disconnect the black (–) jumper cable from the black (–) connecting lead, and then pull the cover completely over the lead terminal.
10. Disconnect the black (–) jumper cable from the negative (–) terminal of the battery used to jump start the engine.
11. Disconnect the red (+) jumper cable from the positive (+) terminal of the battery used to jump start the engine.
12. Disconnect the red (+) jumper cable from the red (+) connecting lead, and then pull the cover completely over the lead terminal.
13. Install the red (+) connecting lead into the lead holder.
14. Install the right side cover and the shroud.

NOTE:
Make sure that both the red (+) connecting lead and the black (–) connecting lead are seated securely in the lead holders.

Electric starter does not operate or operates slowly

- Engine stop switch is pushed in: Pull it out.
- Faulty wire connections: Check connections or ask a Yamaha dealer to inspect.
- Discharged battery: Charge battery or see "Starting the engine with a discharged battery" above.
- Seized engine: Seizure is caused by poor lubrication, inadequate fuel, or an air leak. Ask a Yamaha dealer to inspect.
- "Hydrostatic lock" occurs when fuel has filled the cylinders when the vehicle has been transported: Remove the spark plugs and turn the engine over several times with the ignition off to expel excess fuel. Ask a Yamaha dealer to inspect.

Engine power is low

- Low coolant temperature indicator light is flashing: Warm the engine up.
- Faulty spark plugs: Clean or replace the spark plugs.
- Incorrect carburetor jetting for altitude or temperature: Ask a Yamaha dealer to inspect.
- Improper fuel flow: See "Engine turns over but does not start–Fuel system" above.
- Incorrect V-belt clutch settings for altitude or conditions: Ask a Yamaha dealer to inspect.

Engine constantly backfires or misfires

- Faulty spark plugs: Replace the spark plugs.
- Clogged fuel system: See "Engine turns over but does not start–Fuel system" above.
- Malfunctioning T.O.R.S.: See "Engine turns over but does not start–Electrical system" above.

Engine overheats

- Insufficient coolant: Add coolant.
- Air in cooling system: Bleed the cooling system or ask a Yamaha dealer to inspect.
- Leaking coolant: Ask a Yamaha dealer to inspect.

Snowmobile does not move

- Malfunctioning V-belt clutch: Ask a Yamaha dealer to inspect.
- Drive track does not move: Foreign object is caught in the drive track, or slide runners have melted to the slide metal due to lack of lubrication.
- Tight, loose, or broken drive chain: Ask a Yamaha dealer to inspect.

V-belt twists

- Improper V-belt: Replace with the correct V-belt.

- Incorrect V-belt clutch offset: Ask a Yamaha dealer to inspect.
- Loose or broken engine mount(s): Ask a Yamaha dealer to inspect.

V-belt slips or becomes extremely hot

- Oily or dirty V-belt or primary and secondary sheave assembly surfaces: Clean.
- Problem with the driveline: See "V-belt twists" above.

Engine does not upshift or downshift properly or engages harshly

- Worn or damaged V-belt: Replace the V-belt or ask a Yamaha dealer to inspect.
- Incorrect V-belt clutch settings for altitude or conditions: Ask a Yamaha dealer to inspect.
- Worn or sticking primary sheave assembly: Ask a Yamaha dealer to inspect.
- Worn or sticking secondary sheave assembly: Ask a Yamaha dealer to inspect.

Noise or excessive vibration in drive chain and sprockets

- Broken V-belt clutch components: Ask a Yamaha dealer to inspect.
- Worn or damaged bearings: Ask a Yamaha dealer to inspect.
- Worn or damaged V-belt with flat spots: Replace.
- Worn or damaged idler wheels or shafts: Ask a Yamaha dealer to inspect.
- Worn or damaged drive track: Ask a Yamaha dealer to inspect.

Storage

ESU12410

Long-term storage requires some preventive procedures to guard against deterioration.

Cleaning

Thoroughly clean the snowmobile, inside and out, to remove the corrosive salts and acids that can accumulate. Use Yamaha Mud, Grease, and Engine Cleaner, or an equivalent product, to loosen mud, grease, and grime. Wash with mild soap, then rinse and dry completely.

Lubrication

Lubricate moving parts, suspension linkage, and pivot points. Use the grease or lubricant specified in the MAINTENANCE section, or Yamaha Lube-Zall general-purpose lubricant. Proper lubrication fights corrosion while it reduces friction.

Fuel system

Add Yamaha Fuel Stabilizer and Conditioner, or an equivalent stabilizer, to the fuel tank to help prevent fuel oxidation and gum and varnish deposits, and to inhibit corrosion in the fuel system and carburetor. In areas where oxygenated fuel (gasohol) is used, completely drain the fuel system. Consult a Yamaha dealer if further information is needed.

Engine

Proper storage of the engine is essential to prevent costly rust and corrosion damage to internal engine components. This is more important in areas where oxygenated fuel (gasohol) is used, because the alcohol content in the fuel increases the chance for water to enter the engine. Use Yamaha Stor-Rite Engine Fogging Oil, or an equivalent fogging oil, to protect both the combustion chamber and crankshaft from corrosion. An alternate method is to remove the air filter case and squirt oil into the carburetor throats while the engine is running.

ECS00680

CAUTION:

Do not attempt to store the snowmobile by simply starting the engine occasionally during the storage period. This can cause more harm than good! Moisture and acids form during combustion which can actually increase the chance for corrosion damage during the storage period.

Surface protection

Apply a coat of wax to painted surfaces. Apply suitable protectants to the exterior of the engine, drive track, and to other metal, plastic, and rubber parts.

Battery

EWS00610

⚠ WARNING

- **Never smoke around the battery while it is being charged. Sparks may ignite the hydrogen gas created by the battery.**
- **Disconnect the negative lead first, then the positive lead from the battery.**
- **Connect the positive lead first, then the negative lead to the battery when installing the battery.**
- **Never connect the battery to or disconnect it from the snowmobile while it is being charged. Sparks may ignite the hydrogen gas created by the battery.**
- **Make sure that the battery terminals are tight.**

Remove the battery from the snowmobile. Store it in a cool, dry place that is above 0 °C (32 °F), but less than 30 °C (90 °F). Check the condition of the battery once a month, and charge it as necessary.

ECS00690

CAUTION:

- **Always keep the battery charged. Storing a discharged battery can cause permanent battery damage.**

- **To charge a sealed-type (MF) battery, a special (constant-voltage) battery charger is required. Using a conventional battery charger will damage the battery. If you do not have access to a sealed-type (MF) battery charger, have a Yamaha dealer charge your battery.**
- **Do not charge the battery quickly. Charge the battery for 10 hours at 1.8 amperes.**

Drive track

Loosen the drive track and block up the chassis so that the track is suspended above the ground.

V-belt

Remove the V-belt and store separately.

Storage

Store the snowmobile in a dry, well-ventilated place out of direct sunlight. Put a fabric cover over the snowmobile, preferably one that is designed for it. Do not use a plastic or vinyl cover—condensation could be trapped underneath which could increase the chances of rusting.

Returning to service after storage

When returning your snowmobile to service, install the V-belt and battery and adjust the drive track.

Remove the spark plugs and clean or replace them if necessary. Perform all other pre-operation and seasonal maintenance checks listed in the periodic maintenance chart.

NOTE:

Before installing the battery, have a Yamaha dealer inspect and fully charge it.

For peak performance, it is recommended that you have your snowmobile checked and tuned by a Yamaha dealer. The dealer has the experience and training to help you get the maximum performance and use out of your Yamaha snowmobile.

Specifications

ESU12462

Dimensions:
- Overall length:
  - RS90GT 2755 mm (108.5 in)
  - RS90GTA 2755 mm (108.5 in)
  - RS90LT 3000 mm (118.1 in)
  - RS90LTGT 3000 mm (118.1 in)
  - RS90R 2755 mm (108.5 in)
- Overall width:
  - 1225 mm (48.2 in)
- Overall height:
  - 1160 mm (45.7 in)
- Dry weight:
  - RS90GT 254.0 kg (559 lb)
  - RS90GTA 254.0 kg (559 lb)
  - RS90LT 263.0 kg (577 lb)
  - RS90LTGT 264.0 kg (577 lb)
  - RS90R 253.0 kg (557 lb)
- Ski stance:
  - 1086 mm (42.8 in)

Engine:
- Type:
  - Liquid cooled 4-stroke, 12 valves
- Cylinder arrangement:
  - Backward-inclined parallel 3-cylinder
- Displacement:
  - 973.0 cm^3
- Bore × stroke:
  - 79.0 × 66.2 mm (3.11 × 2.61 in)
- Idling speed:
  - 1300–1500 r/min
- Engine oil:
  - Recommended grade:
    - API service SG type or higher, JASO standard MA
  - Type:
    - SAE 0W-30
- Carburetor:
  - Manufacturer:
    - KEIHIN
  - Model × quantity:
    - CVK40 × 3
- Fuel:
  - Type:
    - REGULAR UNLEADED GASOLINE ONLY
  - Minimum pump octane (R+M)/2:
    - 86
- Starting system:
  - Electric starter

Chassis:
- Drive track:
  - Material:
    - Molded rubber, fiberglass-rod reinforced
  - Type:
    - Internal drive type
  - Width:
    - 381 mm (15.0 in)
  - Deflection:
    - RS90GT 30.0–35.0 mm (1.18–1.38 in)
    - RS90GTA 30.0–35.0 mm (1.18–1.38 in)
    - RS90LT 25.0–30.0 mm (0.98–1.18 in)
    - RS90LTGT 25.0–30.0 mm (0.98–1.18 in)
    - RS90R 30.0–35.0 mm (1.18–1.38 in)
  - Length on ground:
    - RS90GT 768 mm (30.2 in)
    - RS90GTA 768 mm (30.2 in)
    - RS90LT 960 mm (37.8 in)
    - RS90LTGT 960 mm (37.8 in)
    - RS90R 768 mm (30.2 in)
- Rear suspension:
  - Type:
    - Slide rail suspension
- Track sprocket wheel:
  - Material:
    - Polyethylene
  - Number of teeth:
    - 9
- Transmission:
  - Clutch type:
    - Automatic centrifugal engagement
  - Ratio range:
    - 3.80–1.00 :1
  - Sheave distance:
    - 267.0–270.0 mm (10.51–10.63 in)
  - Sheave offset:
    - 13.5–16.5 mm (0.53–0.65 in)
  - Engagement speed (Subject to change according to elevation settings.):
    - RS90GT 3300–3700 r/min
    - RS90GTA 3300–3700 r/min
    - RS90LT 3400–3800 r/min
    - RS90LTGT 3400–3800 r/min
    - RS90R 3300–3700 r/min
  - Shift speed [Subject to change according to elevation settings. Usually achieved after approximately 800m (0.5 mi) traveled.]:
    - 8250–8750 r/min
  - Drive chain type:
    - Silent chain enclosed in oil bath

Reverse system:
Yes
Secondary reduction ratio:
RS90GT 38/22 (1.73)
RS90GTA 38/22 (1.73)
RS90LT 39/22 (1.77)
RS90LTGT 39/22 (1.77)
RS90R 38/22 (1.73)
Secondary reduction ratio [R]:
2.27
Fuel tank capacity:
36.2 L (9.56 US gal) (7.96 Imp.gal)
Engine oil quantity:
With oil filter cartridge replacement:
2.5 L (2.64 US qt) (2.20 Imp.qt)
Without oil filter cartridge replacement:
2.3 L (2.43 US qt) (2.02 Imp.qt)
Total amount:
3.2 L (3.38 US qt) (2.82 Imp.qt)
Brake:
Type:
Hydraulic disc type (ventilated disc)
Operation:
Handle lever, left-hand operated
Throttle:
Operation:
Handle lever, right-hand operated

Electrical system:

Ignition system:
T.C.I.
Spark plug:
Manufacturer:
NGK
Model:
CR8E
Gap:
0.7–0.8 mm (0.028–0.031 in)
Battery:
Model:
YTX20L-BS
Voltage, capacity:
12 V, 18.0 Ah
Ten-hour rate amperage:
1.8 A
Bulb voltage, wattage × quantity:
Headlight:
12 V, 60/55 W × 2
Headlight bulb type:
Halogen bulb
Tail/brake light:
12 V, 5/21 W × 2
Meter lighting:
14 V, 50 mA × 6
High beam indicator light:
14 V, 80 mA × 1
Warning light:
14 V, 80 mA × 1
Low coolant temperature indicator light:
14 V, 80 mA × 1

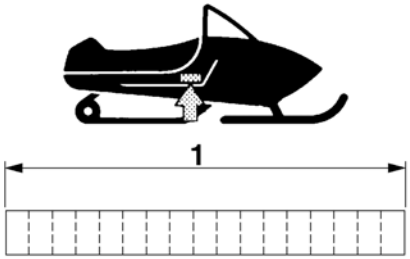
ESU12480
Identification number records

Record the frame serial number, engine serial number (Primary ID), and key identification number in the spaces provided for assistance when ordering spare parts from a Yamaha dealer.

Also, record and keep the ID numbers in a separate place in case the snowmobile is stolen.

Frame serial number

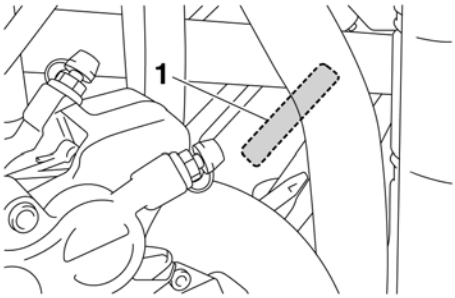
The frame serial number is the seventeen-digit number stamped on the frame of the snowmobile.



1. Frame serial number

Engine serial number (Primary ID)

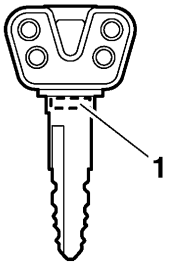
The engine serial number is stamped in the location as shown.



1. Engine serial number

Key identification number

The key identification number is stamped in the location as shown.



1. Key identification number

ESU12500
YAMAHA MOTOR CORPORATION, U.S.A. SNOWMOBILE LIMITED WARRANTY

Yamaha Motor Corporation, U.S.A. hereby warrants that new Yamaha snowmobiles purchased from an authorized Yamaha snowmobile dealer in the continental United States will be free from defects in material and workmanship for the period of time stated herein, subject to certain stated limitations.

WARRANTY PERIOD:
1. All Yamaha snowmobiles shall be warranted for a term of one (1) year from the date of purchase, plus a special early-season extension (if applicable).
2. All Yamaha snowmobile clutch components are warranted against abnormal wear for one (1) year from the date of purchase, plus a special early-season extension (if applicable).

DURING THE PERIOD OF WARRANTY any authorized Yamaha snowmobile dealer will, free of charge, repair or replace, at Yamaha's option, any part adjudged defective by Yamaha due to faulty workmanship or material from the factory. Parts used in warranty repairs will be warranted for the balance of the snowmobile's warranty period. All parts replaced under warranty become the property of Yamaha Motor Corporation, U.S.A.

GENERAL EXCLUSIONS from this warranty shall include any failures to the machine caused by:
1. Competition, racing, or non-Yamaha authorized rental use.
2. Operation on surfaces other than snow or ice.
3. Installation of parts or accessories that are not qualitatively equivalent to genuine Yamaha parts.
4. Abnormal strain, neglect, or abuse.
5. Lack of proper maintenance.
6. Accident or collision damage.
7. Modification to original parts.

SPECIFIC EXCLUSIONS from this warranty shall include parts replaced due to normal wear or routine maintenance including oil, spark plugs, clutch drive belts, slide runners, and track.

THE CUSTOMER'S RESPONSIBILITY under this warranty shall be to:
1. Operate and maintain the snowmobile as specified in the appropriate Owner's Manual.
2. Give notice to an authorized Yamaha snowmobile dealer of any and all apparent defects within ten (10) days after discovery, and make the machine available at that time for inspection and repairs at such dealer's place of business. You may locate your nearest authorized Yamaha dealer through your local telephone directory.

WARRANTY TRANSFER: To transfer any remaining warranty from the original purchaser to any subsequent purchaser, it is imperative that the machine be inspected and registered for warranty by an authorized Yamaha snowmobile dealer. In order for this warranty to remain in effect, this inspection and registration must take place within ten (10) days after ownership transfer. An inspection and registration fee will be charged for this service.

EMISSION CONTROL SYSTEM WARRANTY
Yamaha Motor Corporation, USA also warrants to the ultimate purchaser and each subsequent purchaser of each 2006 and later model Yamaha snowmobile covered by this warranty that the vehicle is designed, built, and equipped so as to conform at the time of sale with all U.S. emissions standards applicable at the time of manufacture and that it is free from defects in materials and workmanship which would cause it not to meet these standards within the period listed immediately below. Failures other than those resulting from defects in material or workmanship which arise solely as a result of owner abuse and/or lack of proper maintenance are not covered by this warranty.

All Models
Thirty (30) months from the original purchase date

YAMAHA MOTOR CORPORATION, U.S.A. MAKES NO OTHER WARRANTY OF ANY KIND, EXPRESSED OR IMPLIED. ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE WHICH EXCEED THE OBLIGATIONS AND TIME LIMITS STATED IN THIS WARRANTY ARE HEREBY DISCLAIMED BY YAMAHA MOTOR CORPORATION, U.S.A. AND EXCLUDED FROM THIS WARRANTY.

SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU. ALSO EXCLUDED FROM THIS WARRANTY ARE ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES INCLUDING LOSS OF USE. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE EXCLUSION MAY NOT APPLY TO YOU.

THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE.

SPECIAL EARLY-SEASON WARRANTY EXTENSION

A special warranty extension is available for all new Yamaha snowmobiles purchased between June 1 and December 1.

All new Yamaha snowmobiles purchased between June 1 and December 1 will have the warranty extended to November 30 of the following year.

YAMAHA MOTOR CORPORATION, U.S.A.
Post Office Box 6555
Cypress, California 90630

WARRANTY QUESTIONS AND ANSWERS

Q. What costs are my responsibility during the warranty period?
A. The customer's responsibility includes all costs of normal maintenance services, non-warranty repairs, accident and collision damages, as well as oil, spark plugs, clutch drive belts, and slide runners.

Q. What are some examples of "abnormal" strain, neglect, or abuse?
A. These terms are general and overlap each other in areas. Specific examples include: Running the machine out of oil, hitting an object submerged under snow, operation on surfaces other than snow or ice, operating the machine with a broken or damaged part which causes another part to fail, and so on. If you have any specific questions on operation or maintenance, please contact your dealer for advice.

Q. May I perform any or all of the recommended maintenance shown in the Owner's Manual instead of having the dealer do them?
A. Yes, if you are a qualified snowmobile mechanic and follow the procedures specified in the Owner's and Service Manual. We do recommend, however, that items requiring special tools or equipment be done by a Yamaha snowmobile dealer.

Q. Under what conditions is the clutch not covered by warranty?
A. Clutches as well as clutch components wear with use. Normal wear is not covered under warranty such service is the customer's responsibility. Abnormal wear is, however, covered for one (1) year from the date of purchase. Your Yamaha snowmobile dealer possesses criteria as to what constitutes abnormal wear.

Q. Will the warranty be void or canceled if I do not operate or maintain my new Yamaha exactly as specified in the Owner's Manual?
A. No. The warranty on a new Yamaha cannot be "voided" or "canceled." However, if a particular failure is caused by operation or maintenance other than as shown in the Owner's Manual, that failure may not be covered under warranty.

Q. What responsibility does my dealer have under this warranty?
A. Each Yamaha snowmobile dealer is expected to:
1. Completely set up every new machine before sale.
2. Explain the operation, maintenance, and warranty requirements to your satisfaction at the time of sale, and upon your request at any later date.
3. In addition, each Yamaha snowmobile dealer is held responsible for his setup, service and warranty repair work.

Q. Whom should I contact if I have further questions about this warranty?
A. Your Yamaha snowmobile dealer has the information and experience necessary to answer almost any questions about this warranty. If the dealer is not able to do so, he is expected to contact Yamaha Motor Corporation, U.S.A., for clarification or assistance.

CUSTOMER SERVICE

If your machine requires warranty service, you must take it to any authorized Yamaha snowmobile dealer within the continental United States. Be sure to bring your warranty identification card or other valid proof of the original date of purchase. If a question or problem arises regarding warranty, first contact the owner of the dealership. Since all warranty matters are handled at the dealer level, this person is in the best position to help you. If you are still not satisfied and require additional assistance, please write:

YAMAHA MOTOR CORPORATION, U.S.A.
CUSTOMER RELATIONS
DEPARTMENT
P.O. Box 6555
Cypress, California 90630

When contacting Yamaha Motor Corporation, U.S.A. be sure to include the model, serial number, names, dates, and receipts.

CHANGE OF ADDRESS

The federal government requires each manufacturer of a motor vehicle to maintain a complete, up-to-date list of all first purchasers against the possibility of a safety-related defect and recall. This list is compiled from the purchase registrations sent to Yamaha Motor Corporation, U.S.A. by the selling dealer at the time of your purchase.

If you should move after you have purchased your new snowmobile, please advise us of your new address by sending a postcard listing your snowmobile model name, engine serial number, dealer number (or dealer's name) as it is shown on your warranty registration identification, your name and new mailing address. Mail to:

YAMAHA MOTOR CORPORATION, U.S.A.
WARRANTY DEPARTMENT
P.O. Box 6555
Cypress, California 90630

This will ensure that Yamaha Motor Corporation, U.S.A. has an up-to-date registration record in accordance with federal law.

ESU12510

YAMAHA EXTENDED SERVICE (Y.E.S.)

Keep your Yamaha protected even after your warranty expires with genuine Yamaha Extended Service (Y.E.S.).

- Y.E.S. is designed and administered by Yamaha Motor Corporation to provide maximum owner satisfaction. You get uninterrupted factory-backed coverage for extra peace of mind.
- Y.E.S. is flexible. You choose the plan that's right for you: 12 months, 24 months, 36 months, or every 48 months (on selected models) beyond your warranty period.
- Y.E.S. is designed and administered by the same Yamaha people who handle your warranty—and it shows in the comprehensive coverage benefits. There are no mileage limitations, and Y.E.S. covers manufacturing defects just like the warranty. See the sample contract at your Yamaha dealer to see how comforting uninterrupted factory-backed protection can be.
- You don't have to pay anything for covered repairs. There's no deductible to pay, and repairs aren't "pro-rated." You don't have any "out-of pocket" expenses for covered repairs.
- In addition, Travel and Recreation Interruption Protection (TRIP) is included at no extra cost. TRIP gives you up to $150 reimbursement per occurrence for any reasonable expenses you incur because your Yamaha needs covered service: replacement vehicle rental, emergency towing, phone calls, even food and lodging when you are away from home. This superb coverage goes into effect when you purchase Y.E.S., so it applies to any warranty repairs as well as covered repairs during your entire Y.E.S. plan period.
- Y.E.S. coverage is honored at any authorized Yamaha dealer nationwide.
- Y.E.S. coverage is transferable to a new owner if you sell or trade-in. That can make your Yamaha much more valuable!

This excellent Y.E.S. plan coverage is only available to Yamaha owners like you, and only while your Yamaha is still within the Yamaha Limited Warranty period. So visit your authorized Yamaha dealer to get all the facts. He can show you how easy it is to protect your investment with Yamaha Extended Service.

We urge you to act now. You'll get the excellent benefits of TRIP coverage right away, and you'll rest easy knowing you'll have strong factory-backed protection even after your Yamaha Limited Warranty expires. See your dealer today!

A special note:

If visiting your dealer isn't convenient, contact Yamaha toll free at 1-866-937-3983 (866 YES-EXTD) or visit our web site. All you need to do is provide your vehicle's Primary ID number (your Tunnel number). We'll be happy to help you get the Y.E.S. coverage you need.

Yamaha Service Marketing
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Cypress, CA 90630
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